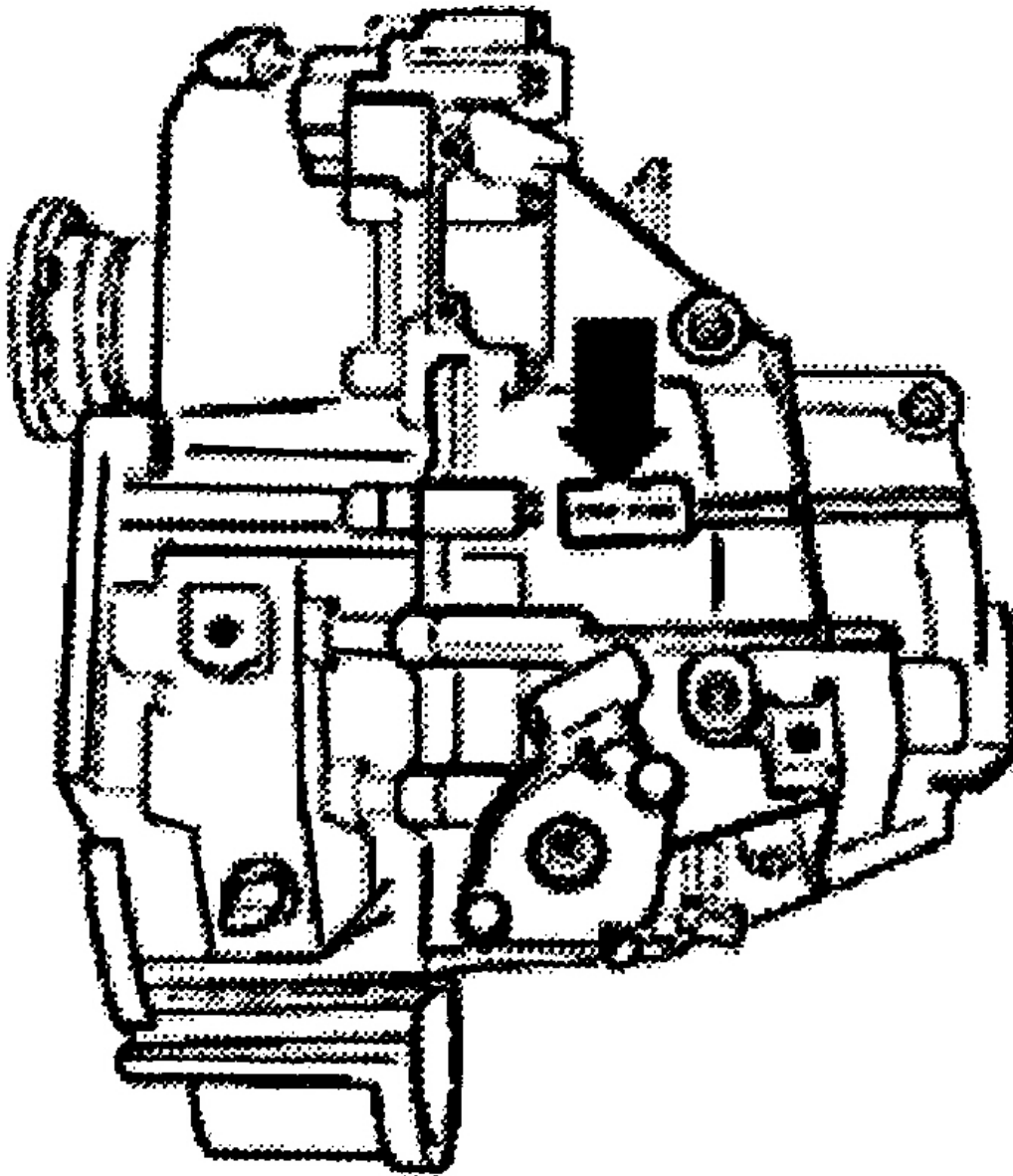


2002-04 CLUTCHES

Clutches - New Beetle (5 & 6 Speed, 02M)

IDENTIFICATION

On 02M transmission model, identification tag is located on transmission, identifying code letters and date of manufacture. See **Fig. 1** .



G00204250

Fig. 1: Locating Identification Tag

Courtesy of VOLKSWAGEN UNITED STATES, INC.

DESCRIPTION & OPERATION

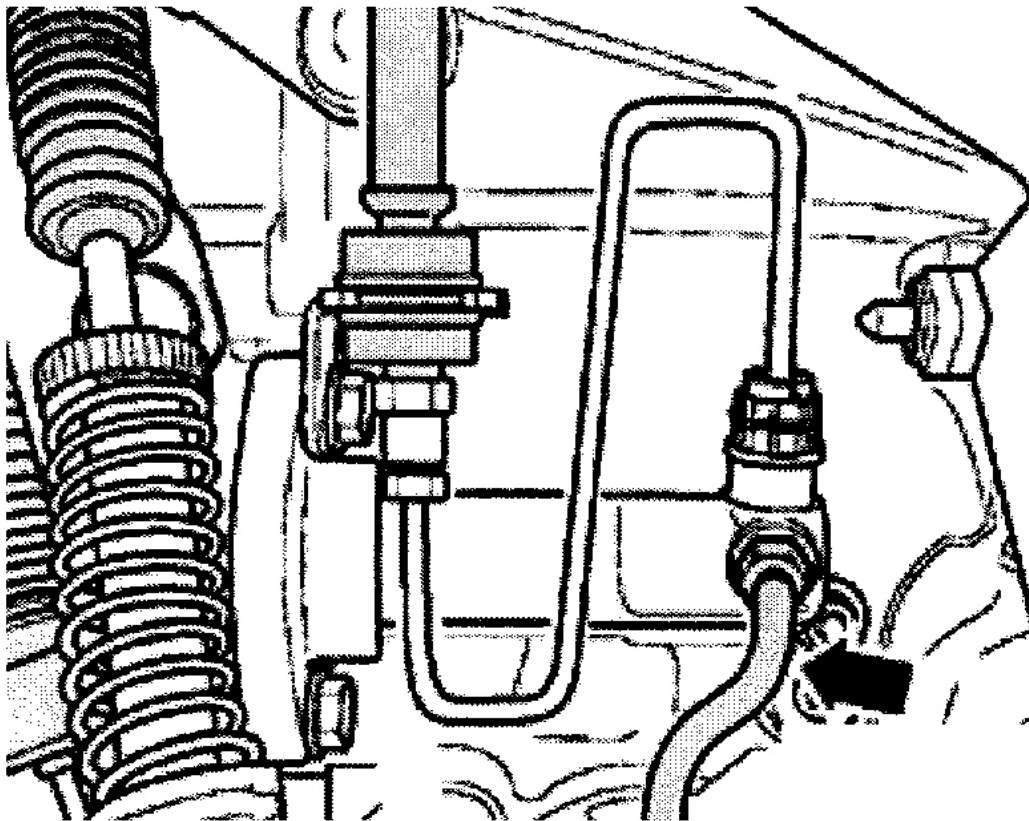
Clutch is a single-disc type, using a diaphragm spring to engage pressure plate. Clutch is hydraulically controlled by master cylinder, slave cylinder, release lever and pre-lubricated release bearing. Clutch release

bearing and slave cylinder are an integral unit, and must be replaced together. Clutch master cylinder is supplied fluid from brake master cylinder fluid reservoir. Flywheel on some models was changed from a single piece solid flywheel to a dual mass flywheel. Note changes in torque specifications for pressure plate.

BLEEDING

NOTE: Fill brake master cylinder reservoir with DOT 4 brake fluid.

1. Connect brake filler/bleeder unit (VAG 5234), or equivalent. Connect bleed hose to brake bleeding collector bottle. Attach hose (arrow) to bleeder (arrow) fitting located on clutch master cylinder, next to hydraulic line



G00370107

Fig. 2: Locating Bleeder Valve

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2. Open bleed valve. See **Fig. 2** . Turn bleed unit on. After finishing bleeding process, depress clutch pedal several times.

ADJUSTMENTS

CLUTCH

NOTE: Hydraulic clutch systems are automatically adjusted and require no manual adjustment.

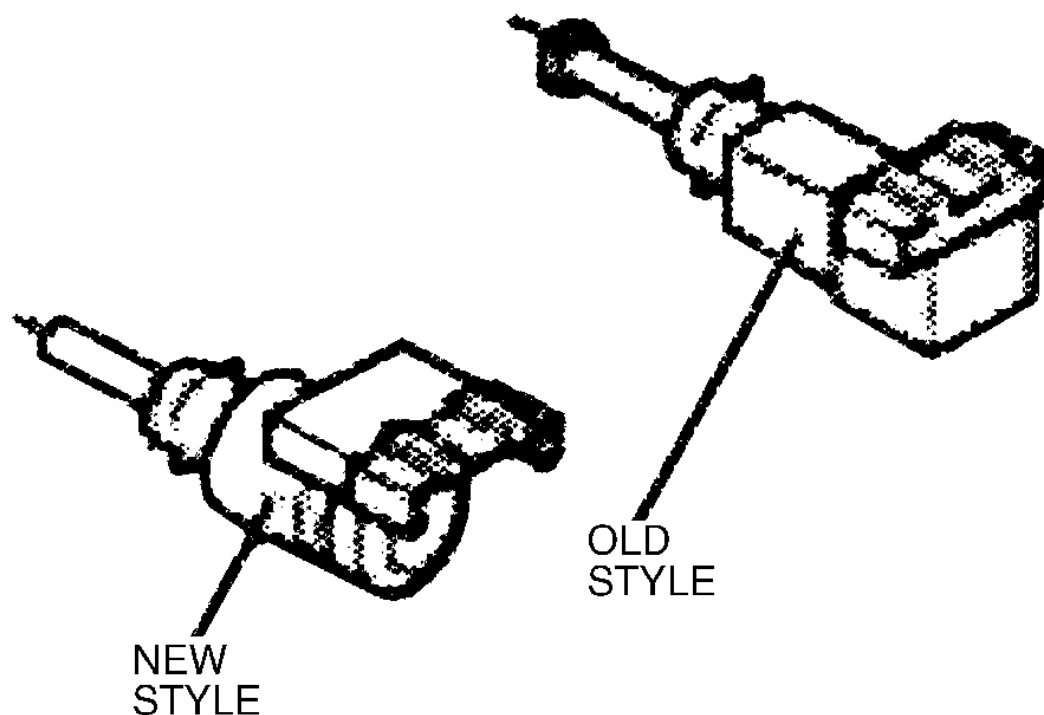
BRAKE LIGHT SWITCH

NOTE: Two different styles of brake light switch were used in production.

For servicing purposes, they will be referred to as "old style" and "new style". It is important to identify which style of switch is installed, prior to servicing, as each requires specific removal and installation (replacement) procedures. See **Fig. 3** .

"Old style" switch is identified by a large (approximately 10 mm) plunger tip button, and a square plunger shaft. "New style" switch is identified by a small (approximately 4 mm) plunger tip without a button, and round plunger shaft. "Old style" switches can be removed and reinstalled/adjusted. "New style" switch must NOT be reused after removal. Always replace.

Should a brake light switch require replacement, only a specific "new style" switch is available (supersedes all previous part number versions). This switch requires critical procedures be followed, prior to and during installation.



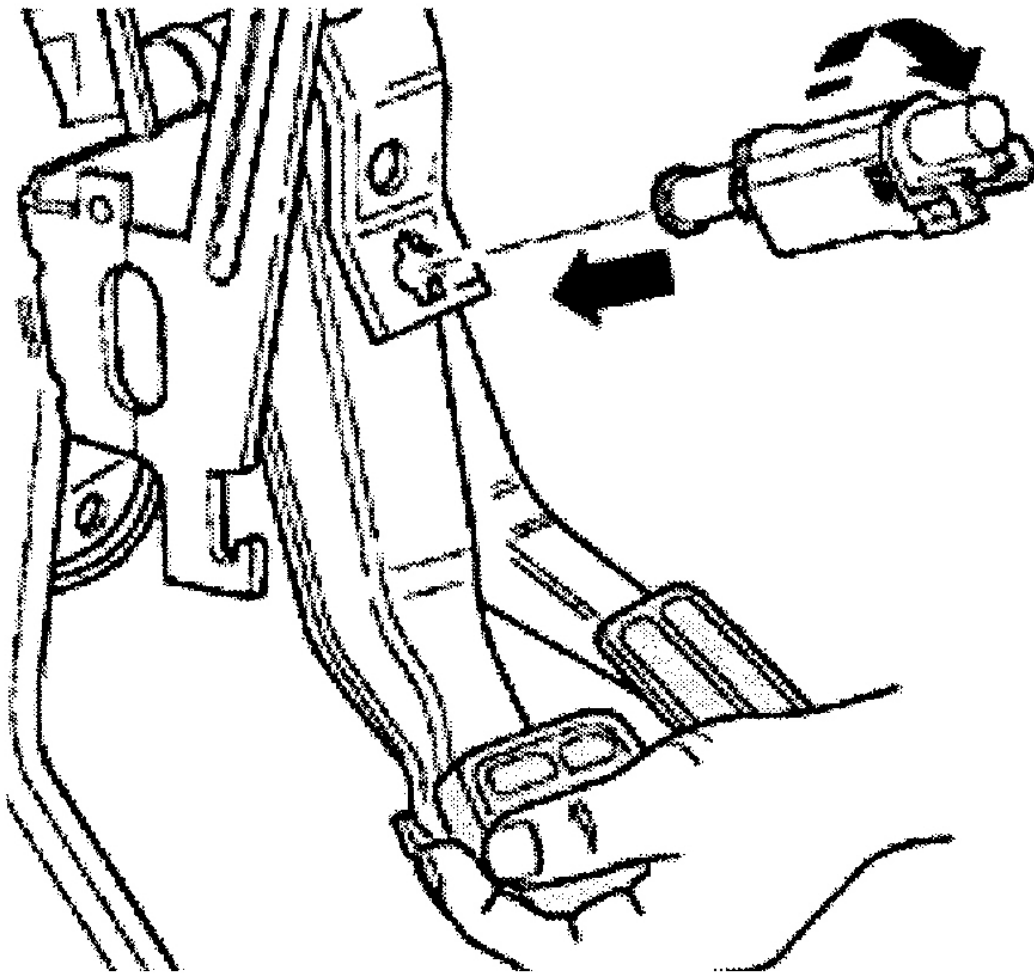
G00340019

Fig. 3: Identifying "New Style" & "Old Style" Brake Switches
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Brake Light Switch (Old Style)

NOTE: The following applies only to an existing, functional "old style" switch that is removed, reinstalled/adjusted.

1. Remove driver's lower instrument panel cover. Disconnect brake light switch harness connector. Turn switch counterclockwise 90 degrees. Pull switch out from retainer mounting hole. See **Fig. 4**.
2. Pull plunger out completely. Depress and hold brake pedal in down position. Note orientation of retainer tabs on switch, and carefully insert switch into retainer mounting hole. Secure switch, by turning clockwise 90 degrees. Slowly release brake pedal to stop. This will automatically adjust switch plunger travel. Connect brake light switch harness connector. Check function of brake light switch.



G00370020

Fig. 4: Removing Brake Light Switch (Old Style)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Brake Light Switch (New Style)

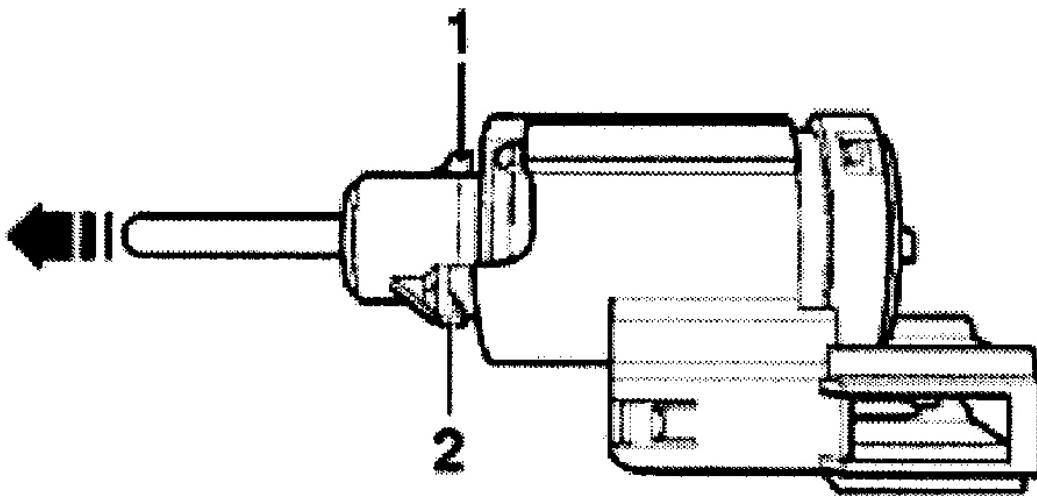
CAUTION: "New style" switches have an internal switch mechanism that will be damaged if not installed and adjusted accordingly. DO NOT depress switch plunger or otherwise rotate retaining collar of switch prior to installation. Brake pedal must be held in Up position (not depressed) during switch installation.

1. Remove driver's lower instrument panel cover. Disconnect brake light switch harness connector. Turn switch counterclockwise 45 degrees. Pull switch out from retainer mounting hole. Pull plunger completely out (arrow). See Fig. 5.

2.

CAUTION: When installing, switch must be rotated until it is fully locked and electrical connector is in horizontal position. Inspect to ensure internal stop pin on retaining collar is fully seated against outer shell.

Hold brake pedal in Up position (against stop). Note orientation of retainer tabs (1 and 2) on switch. Carefully insert switch into retainer mounting hold. Push switch in and seat fully into opening (pressing plunger against brake pedal to adjust). Once seated, secure switch by turning clockwise 45 degrees. This action turns plunger shoe into correct orientation to make electrical contacts in switch operate, as well as locks in plunger adjustment against brake pedal. Connect brake switch connector. Check function of brake light switch.

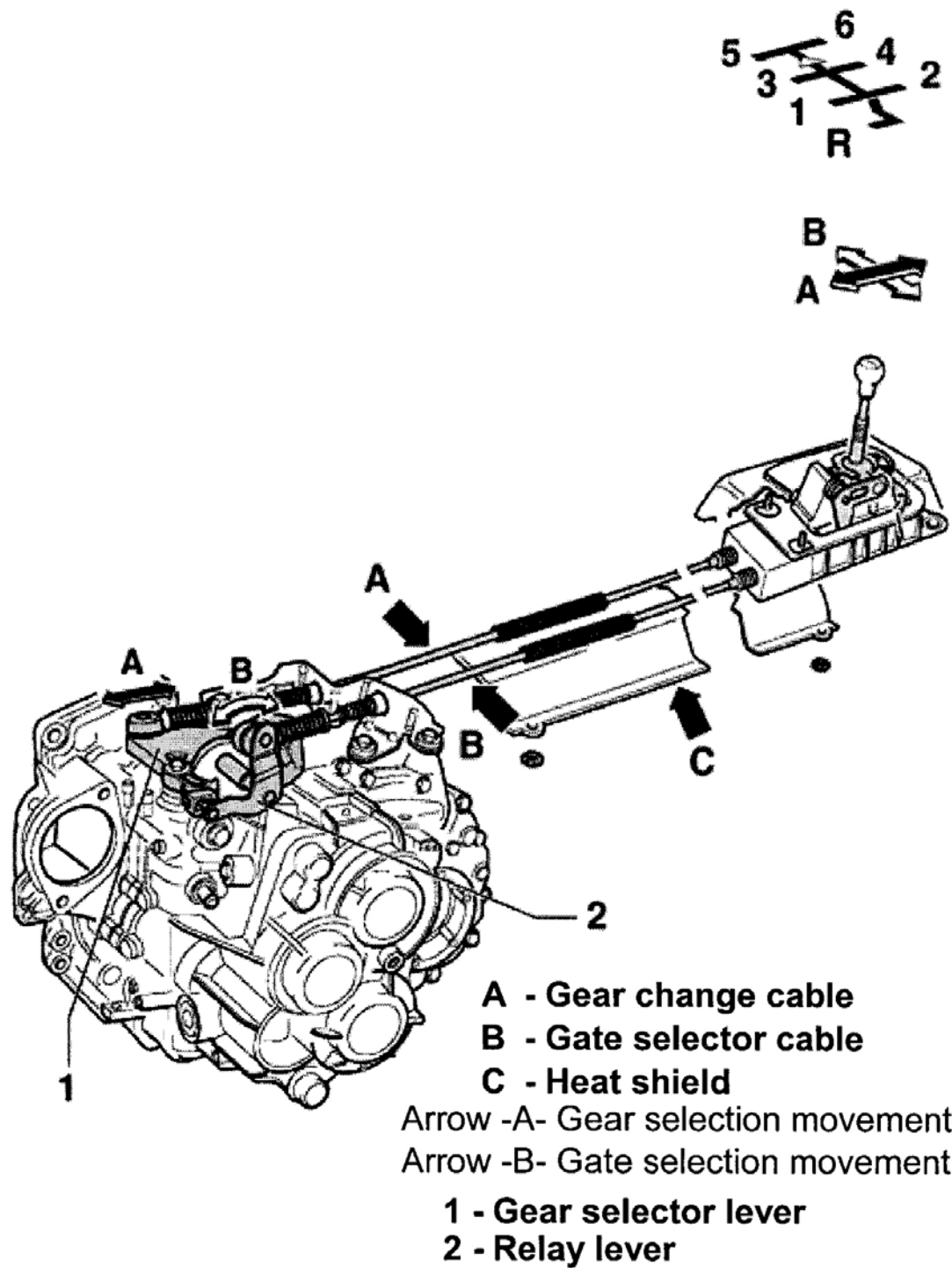


G00370021

Fig. 5: Adjusting Brake Light Switch (New Style)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

SELECTOR MECHANISM

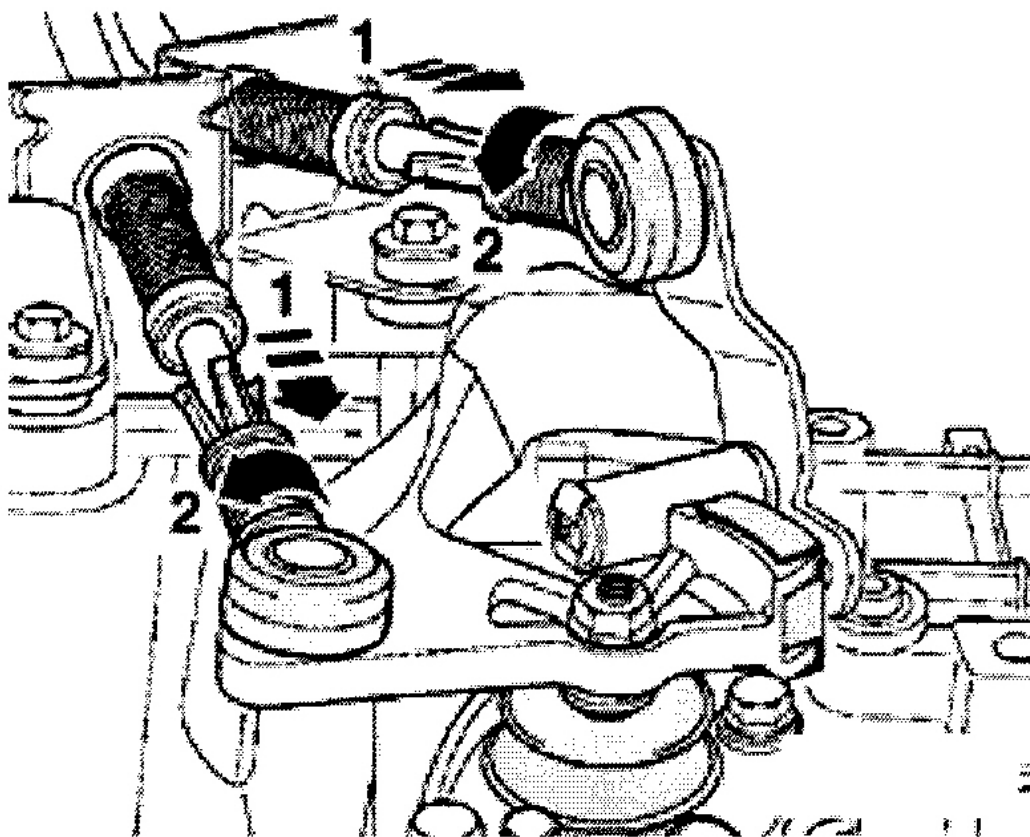
NOTE: To ensure correct gear selector adjustment, moving parts of selector mechanism and transmission elements must be in proper condition. Selector mechanism must move freely. See Fig. 6 . Transmission, clutch and clutch mechanism must also be in proper condition. Transmission is in Neutral position.



G00370059

Fig. 6: Identifying Gear Selector Mechanism Components
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

1. Secure locking mechanism on gear selector cable, and gate selector cable, by pulling forward until stop (arrow 1) and then turning to left to lock (arrow 2). See **Fig. 7** .

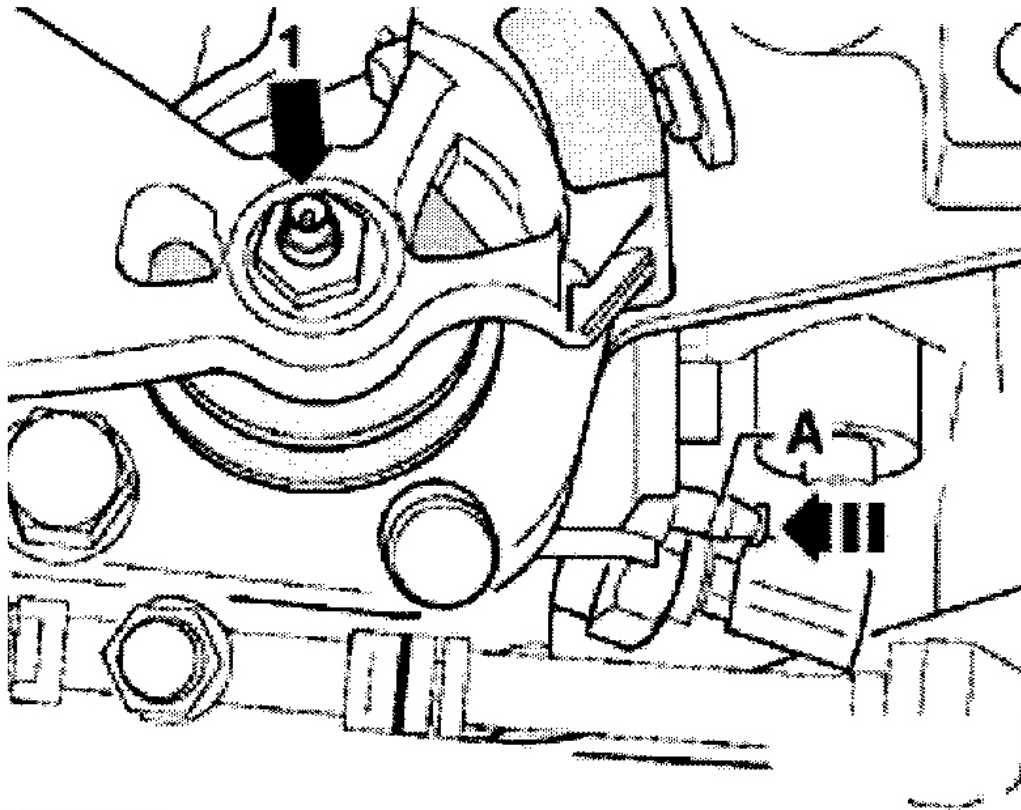


G00370060

Fig. 7: Securing Locking Mechanism

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2. Set selector shaft, by pressing selector shaft down (direction of arrow 1). See **Fig. 8** . While pressing selector shaft down, push locking pin (A) into transmission (direction of arrow 2) until it engages.

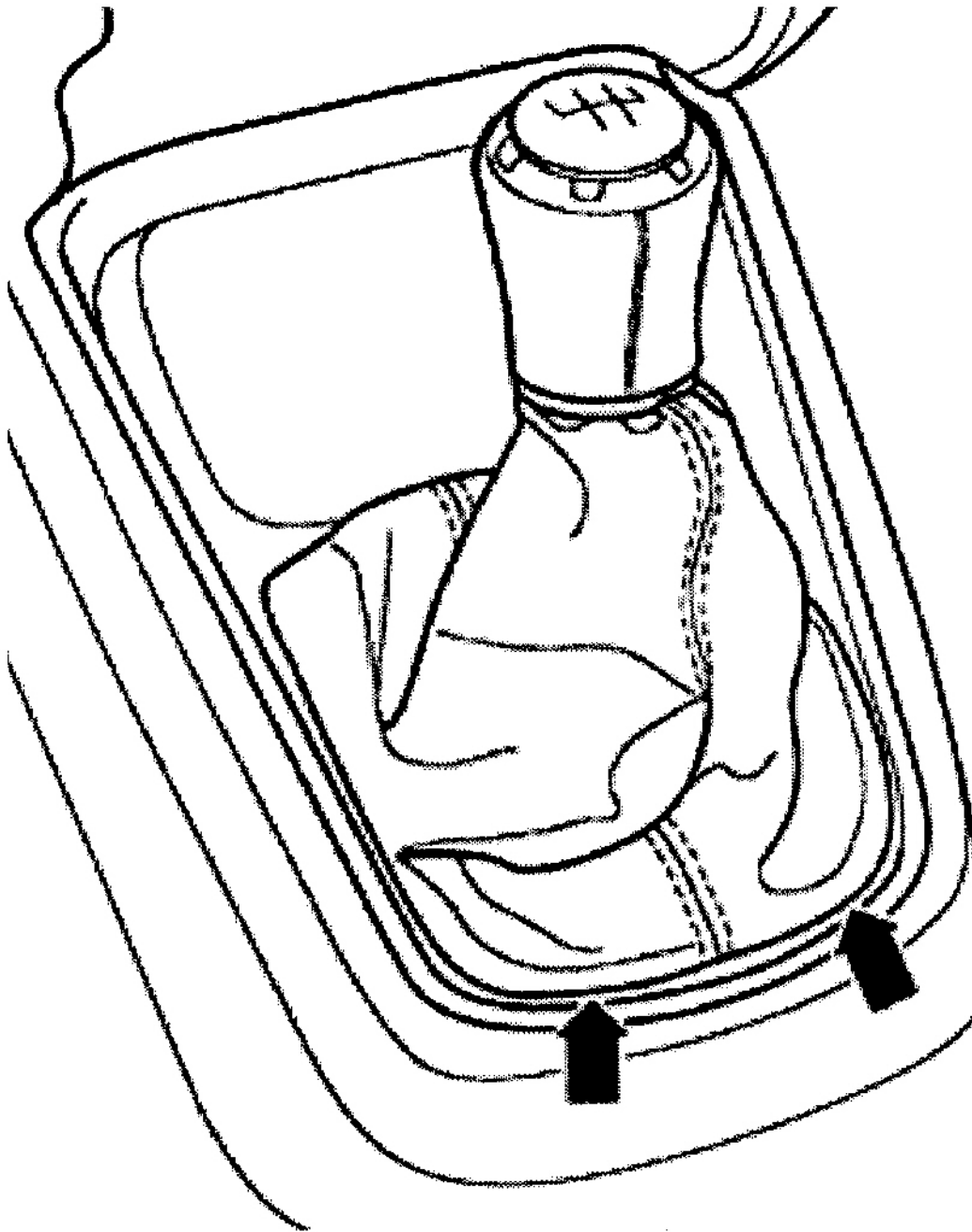


G00370061

Fig. 8: Setting Selector Shaft

Courtesy of VOLKSWAGEN UNITED STATES, INC.

3. Pull gear shift boot off center console (arrow). See **Fig. 9** . Pull cover to rear off center console.

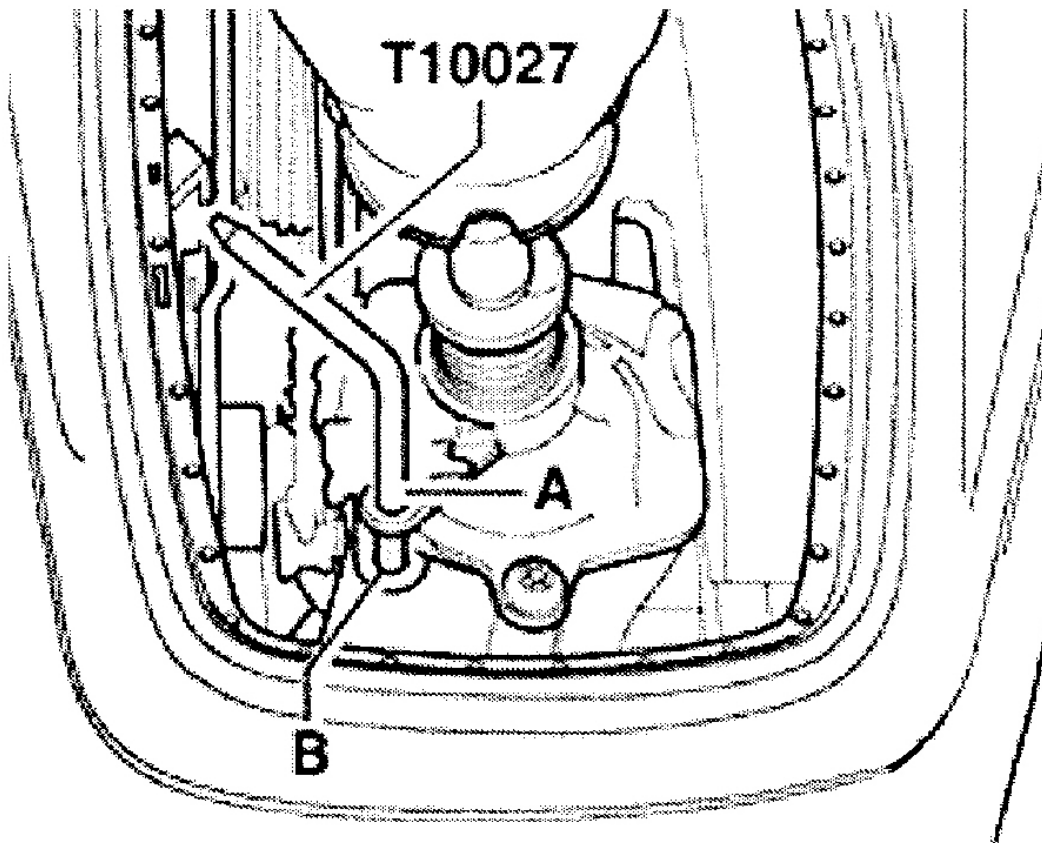


G00370004

Fig. 9: Removing Center Console Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

4. Guide shift lever in Neutral to left into gate for 1st/2nd gear. Guide pin (T10027) through hole (A) and

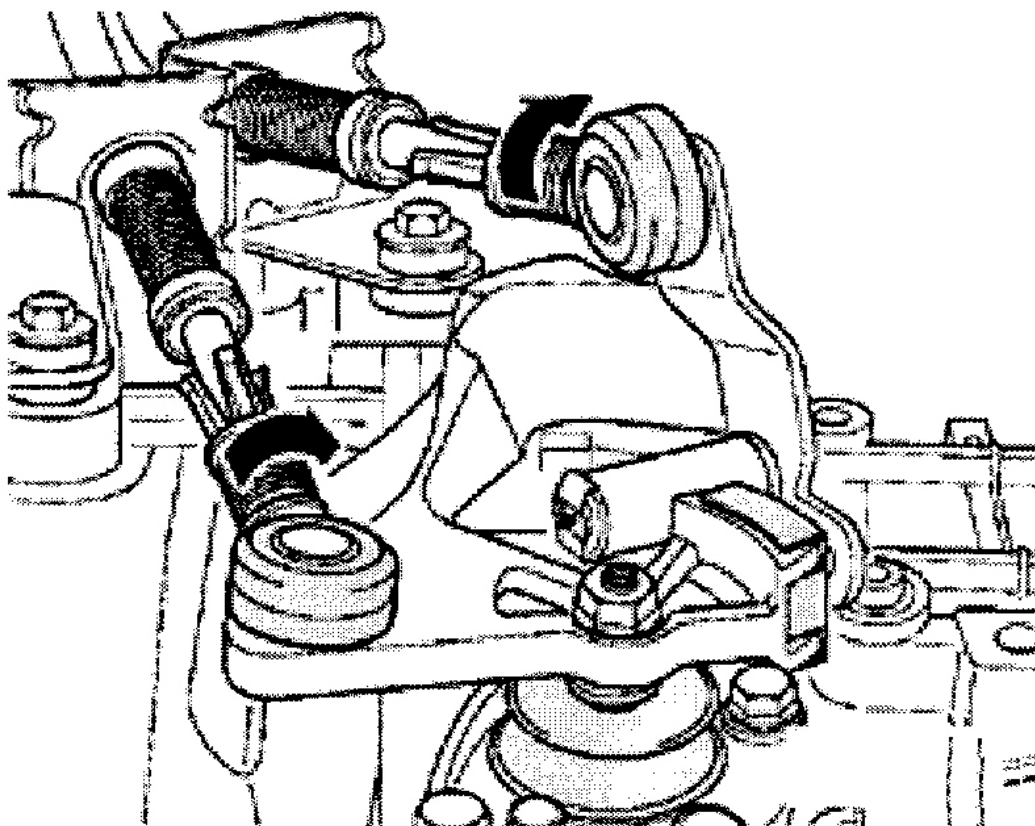
into hole (B). See **Fig. 10** .



G00370015

Fig. 10: Setting Gear Lever Using Guide pin (T10027)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. Turn locking mechanism on gear selector cable and gate selector cable to right onto stop (direction of arrow). See **Fig. 11** . Spring presses locking mechanism into normal position.

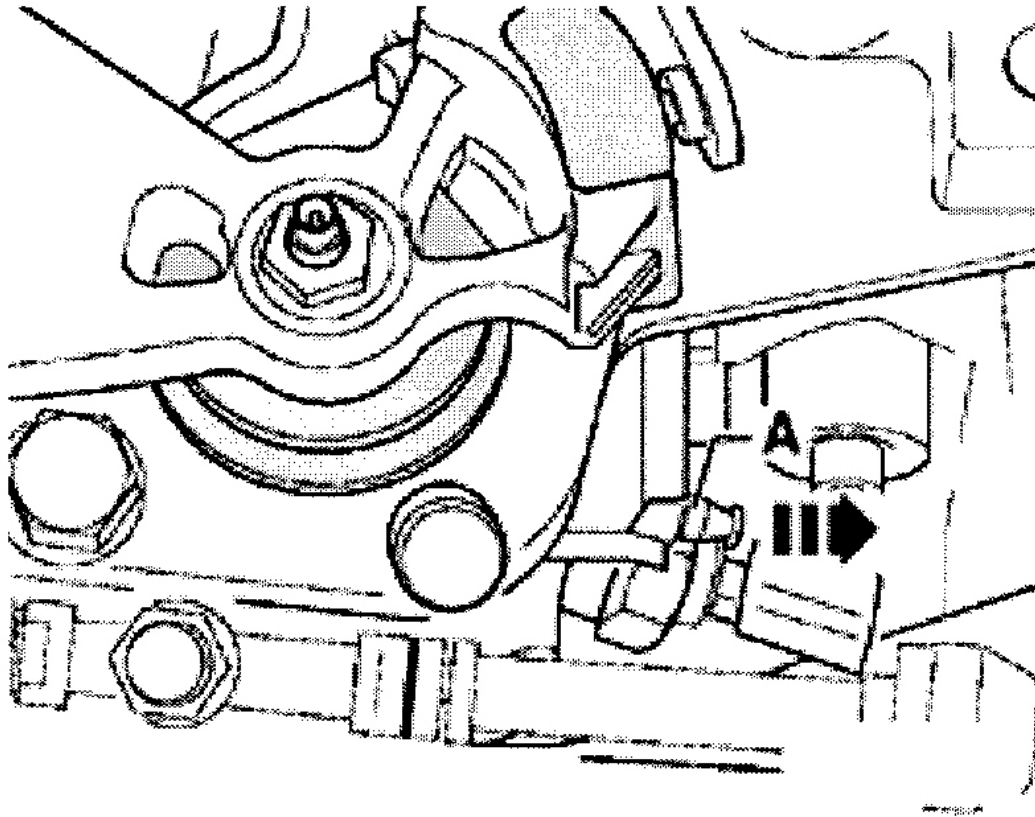


G00370062

Fig. 11: Turning Locking Mechanism

Courtesy of VOLKSWAGEN UNITED STATES, INC.

6. Pull locking pin (A) back to original position (direction of arrow). See **Fig. 12** . Pull pin (T10027) out of holes (A and B). See **Fig. 10** . Clip cover to frame.



G00370063

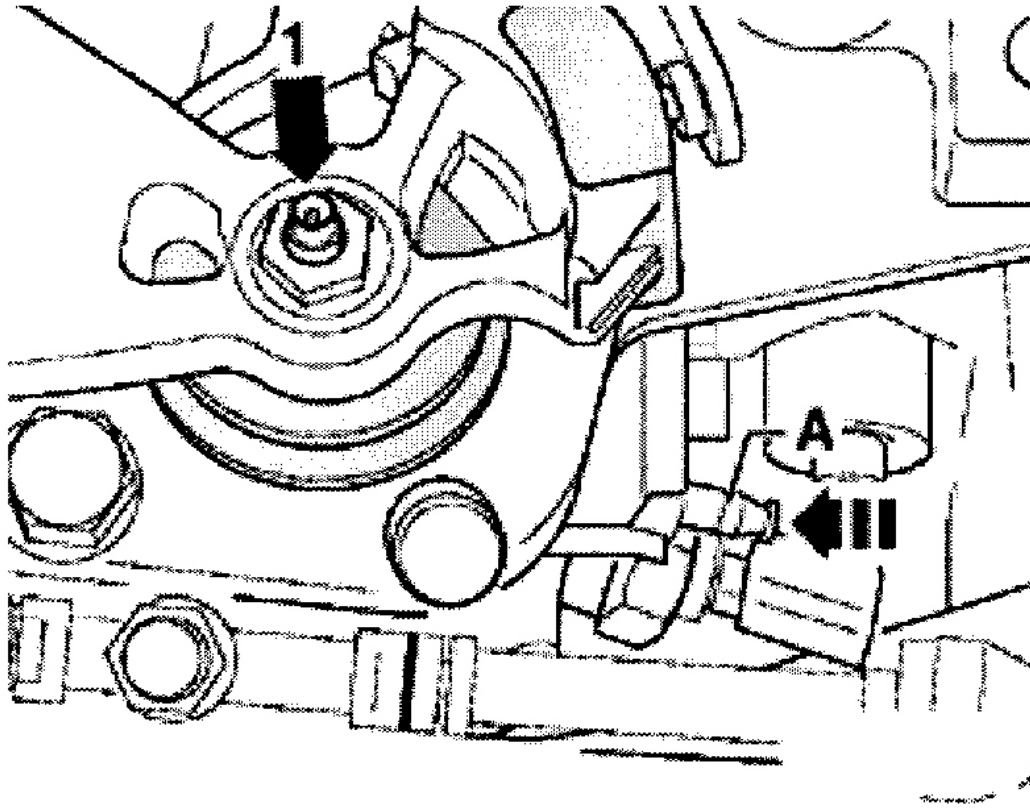
Fig. 12: Positioning Locking Pin

Courtesy of VOLKSWAGEN UNITED STATES, INC.

7.

NOTE: Gear shift lever must rest in 3rd/4th gear gate with transmission in Neutral.

Operate clutch. Select all gears several times. Pay particular attention to operation of reverse gear lock. Should a gear fail to engage smoothly after repeated selection of 1st, 2nd, 5th or 6th gear, selector shaft must move downward (arrow 1). See **Fig. 13** . If shift mechanism is correctly adjusted, locking pin (A) can now be pushed into transmission (direction of arrow). With aid from a second technician selector shaft gate can be pushed into transmission. If not, repeat adjustment.



G00370064

Fig. 13: Checking Selector Mechanism Adjustment
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

BATTERY DISCONNECT PRECAUTIONS

CAUTION: Turn ignition switch to OFF position. Before disconnecting negative battery terminal, obtain anti-theft radio security code. Disconnect negative battery terminal. After reconnecting battery, re-code and check operation of anti-theft radio.

ECM

If connector is disconnected from ECM or the battery is disconnected, all adaptation values in control module are erased. DTC memory content will remain intact however. If engine is started after this, a rough, uneven idle can result. In this case, engine must be allowed to run at idle for a few minutes or a longer road test must be performed until adaptation procedure has been completed.

Once battery has been connected, check operation of radio, clock and convenience electronics. Completely open and close all power windows.

NOTE: Vehicles with On Board Diagnostics (OBD) II must have readiness code for Electronic Control Module (ECM) re-generated after battery has been disconnected. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

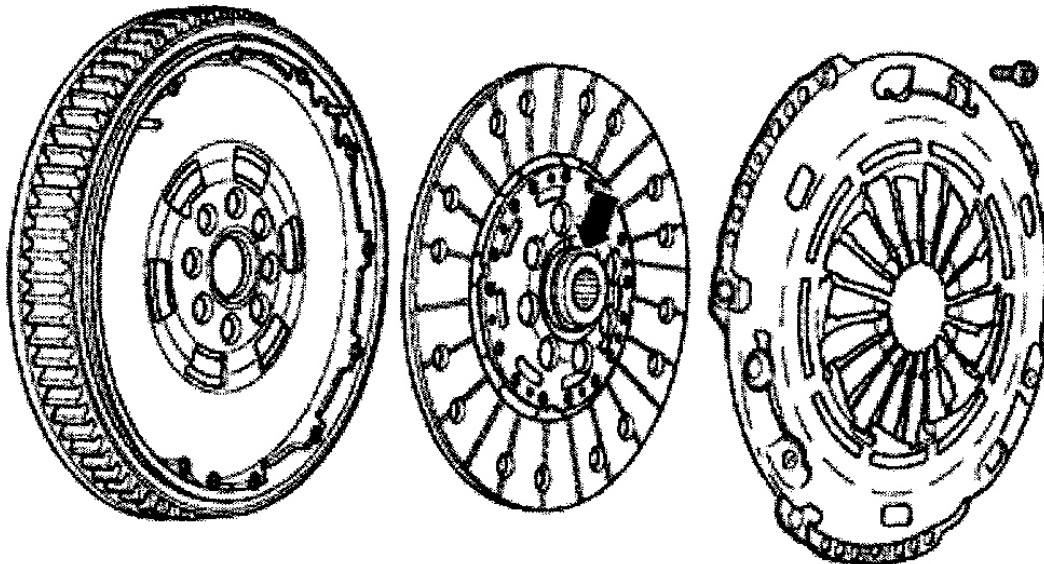
REMOVAL & INSTALLATION

CAUTION: Radio/cassette or radio/CD player is equipped with an anti-theft protection circuit. Whenever battery is disconnected, radio will go into anti-theft mode. When battery is reconnected, radio will display CODE, and will be inoperative until proper code number is entered. Obtain security code before disconnecting battery.

CLUTCH ASSEMBLY

Removal

Remove transmission. See **TRANSMISSION**. Install flywheel holder (3067) on flywheel. Remove pressure plate bolts, evenly in stages and alternating in a diagonal pattern. Supporting clutch disc, remove pressure plate and disc. See **Fig. 14**.



G00370108

Fig. 14: Exploded View Of Clutch Assembly

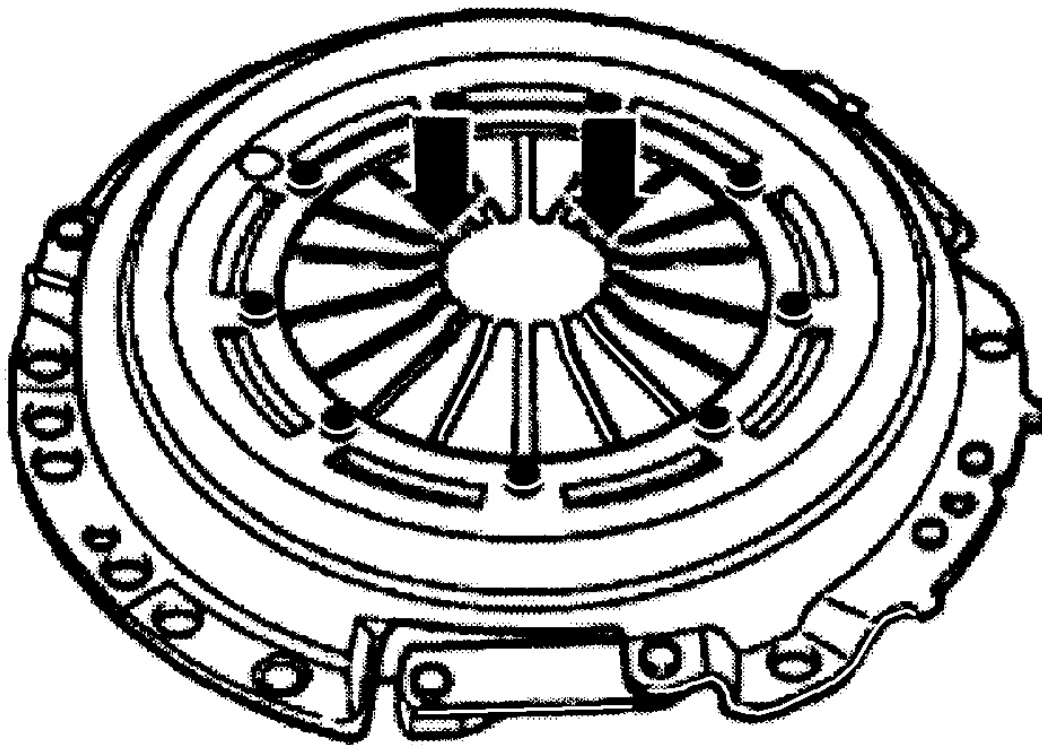
Inspection

1. Inspect pressure plate surface for wear, cracks, burning or warpage. Inspect clutch release bearing for smooth operation and looseness. Replace bearing if noisy, with slave cylinder. DO NOT wash release bearing in solvent.

2.

NOTE: Pressure plate has a protective grease coating. Remove contact surface grease only. Service life will be shortened if remaining portions of pressure plate protective grease are removed.

Inspect pressure plate diaphragm springs. Wear up to half thickness of diaphragm spring is permitted. See **Fig. 15** . Inspect clutch disc lining for excessive wear and burned or oil-soaked condition. Inspect clutch disc for loose rivets and torsion dampers. Measure clutch disc and flywheel runout.



G00366647

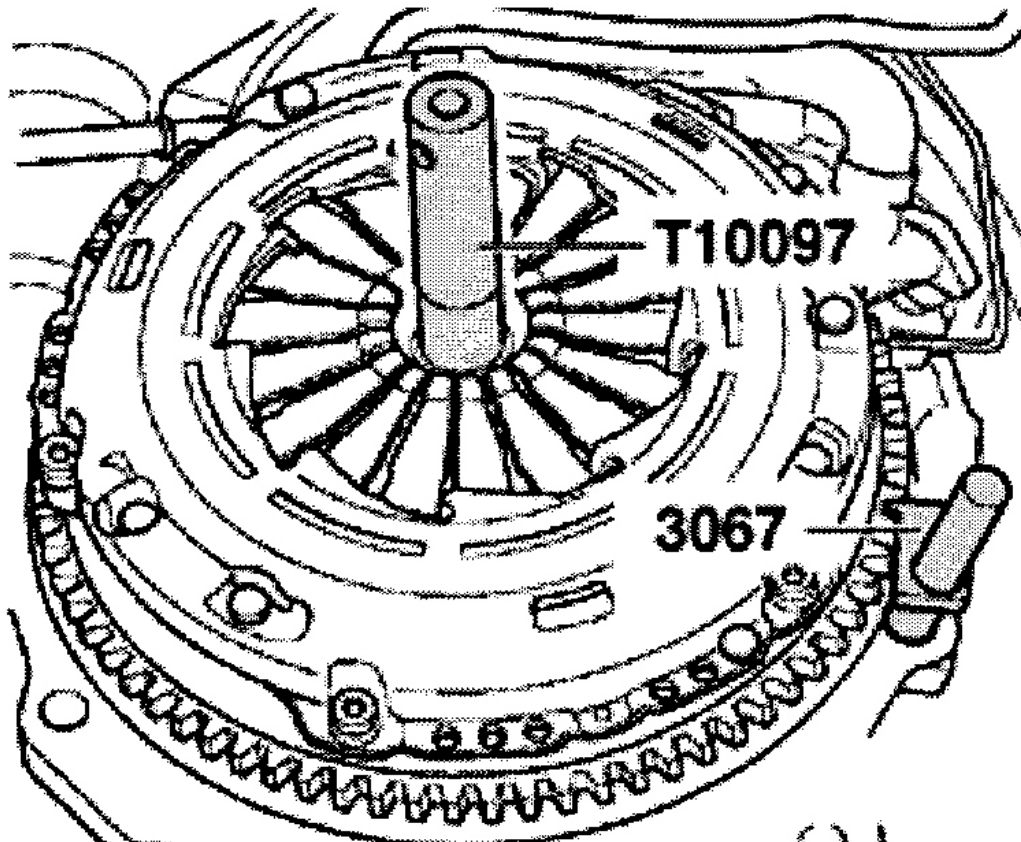
Fig. 15: Inspecting Pressure Plate Diaphragm Spring
Courtesy of VOLKSWAGEN UNITED STATES, INC.

3. On flywheel, ensure centering pins are a tight fit. Contact surface for clutch lining must be free of

grooves, oil and grease. Inspect flywheel ring gear teeth for wear and damage. Inspect flywheel for wear, cracks and burned condition.

Installation

1. To install, reverse removal procedure. Apply grease to ball stud and inner surface of release bearing.
2. Clean input shaft splines and, on used clutch plates, hub splines, remove corrosion and apply only a very thin coating of grease, Part No: G 000 100, to input shaft splines. Then move clutch plate back and forth on input shaft until hub moves freely on shaft. Excess grease must be removed.
3. On models with dual mass flywheel, installed position of clutch disc have a shorter hub end pointing toward pressure plate. On models with single piece flywheel, installed position of clutch disc spring cage faces pressure plate.
4. Install pressure plate bolts finger tight. Using clutch centering tool (T10097), align clutch disc and pilot bushing holes. See **Fig. 16** . Using a crosswise pattern, tighten pressure plate bolts to specification. See **TORQUE SPECIFICATIONS**.



G00370066

Fig. 16: Aligning Clutch Disc

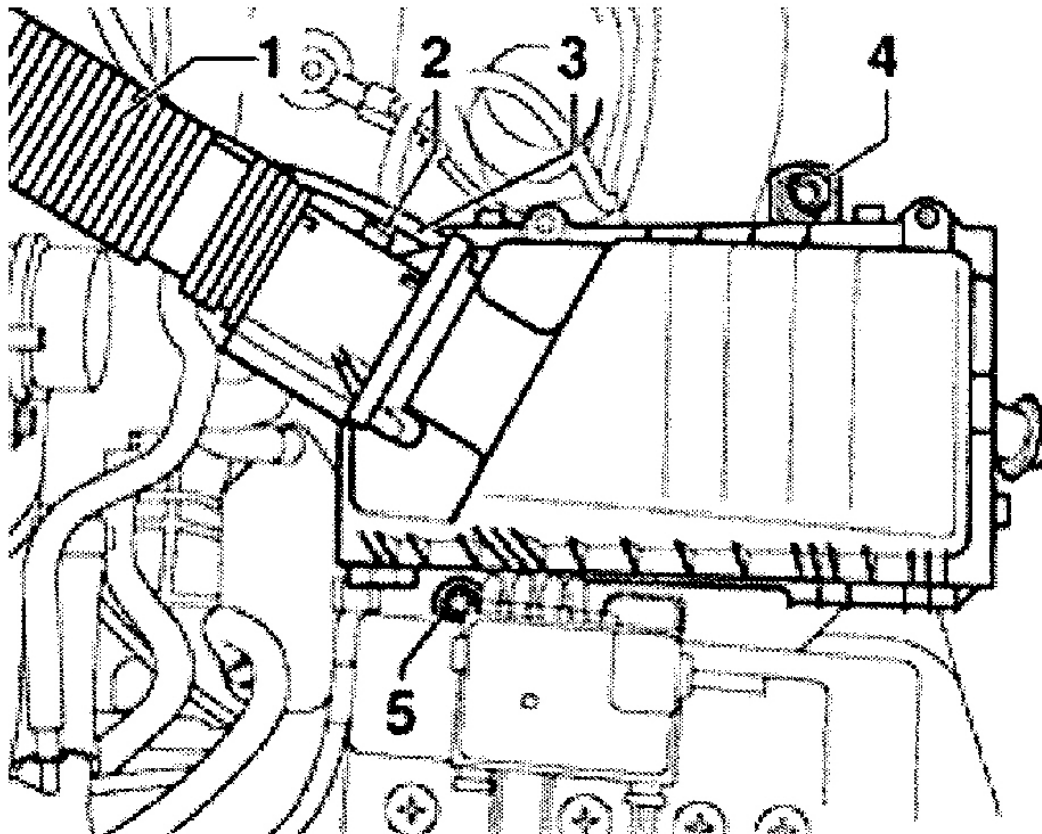
Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. Using flywheel lock (3067) or similar device, hold crankshaft from turning. If removed, tighten flywheel bolts to specification. See **TORQUE SPECIFICATIONS**. Ensure transmission oil level is correct.

CLUTCH MASTER CYLINDER

Removal & Installation

1. Remove intake hose (1), connector (2) and vacuum hose (3) from mass air flow sensor. See **Fig. 17**. Remove complete air cleaner assembly housing by removing 2 bolts.



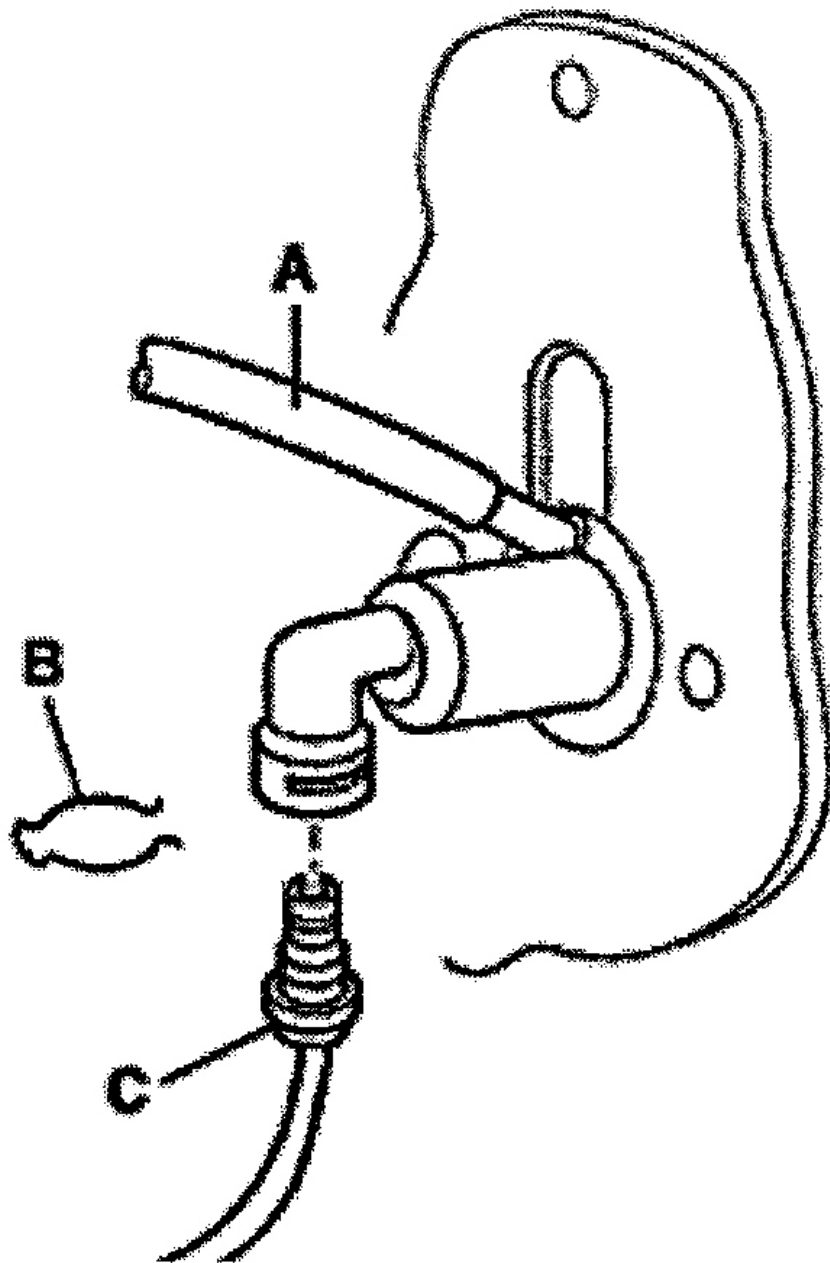
G00370006

Fig. 17: Removing Air Cleaner Housing

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2. Pull off supply hose (A) to brake fluid reservoir and plug hose. See **Fig. 18**. Pry clip (B) for line/hose assembly out of clutch master cylinder. Pull line/hose assembly (C) out of clutch master cylinder and plug

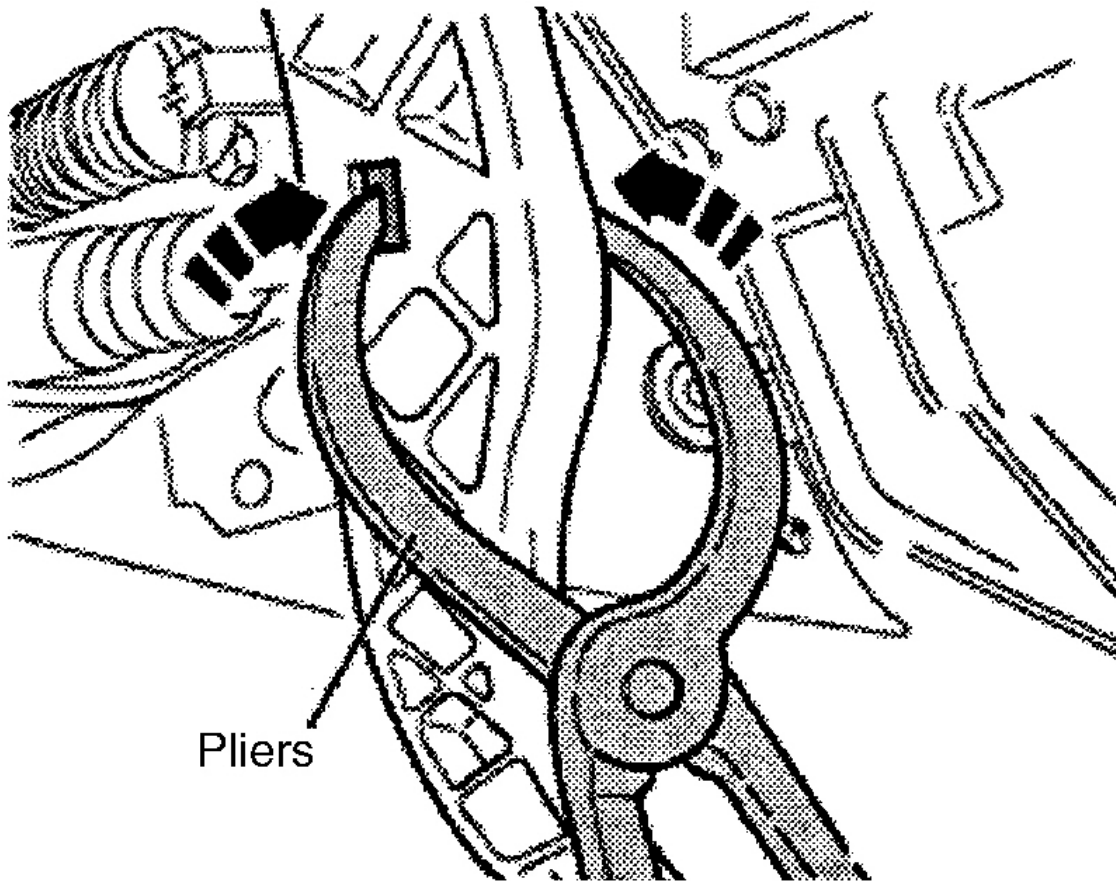
to prevent fluid leakage.



G00204288

Fig. 18: Removing Supply Hose, Clip & Line/Hose Assembly
Courtesy of VOLKSWAGEN UNITED STATES, INC.

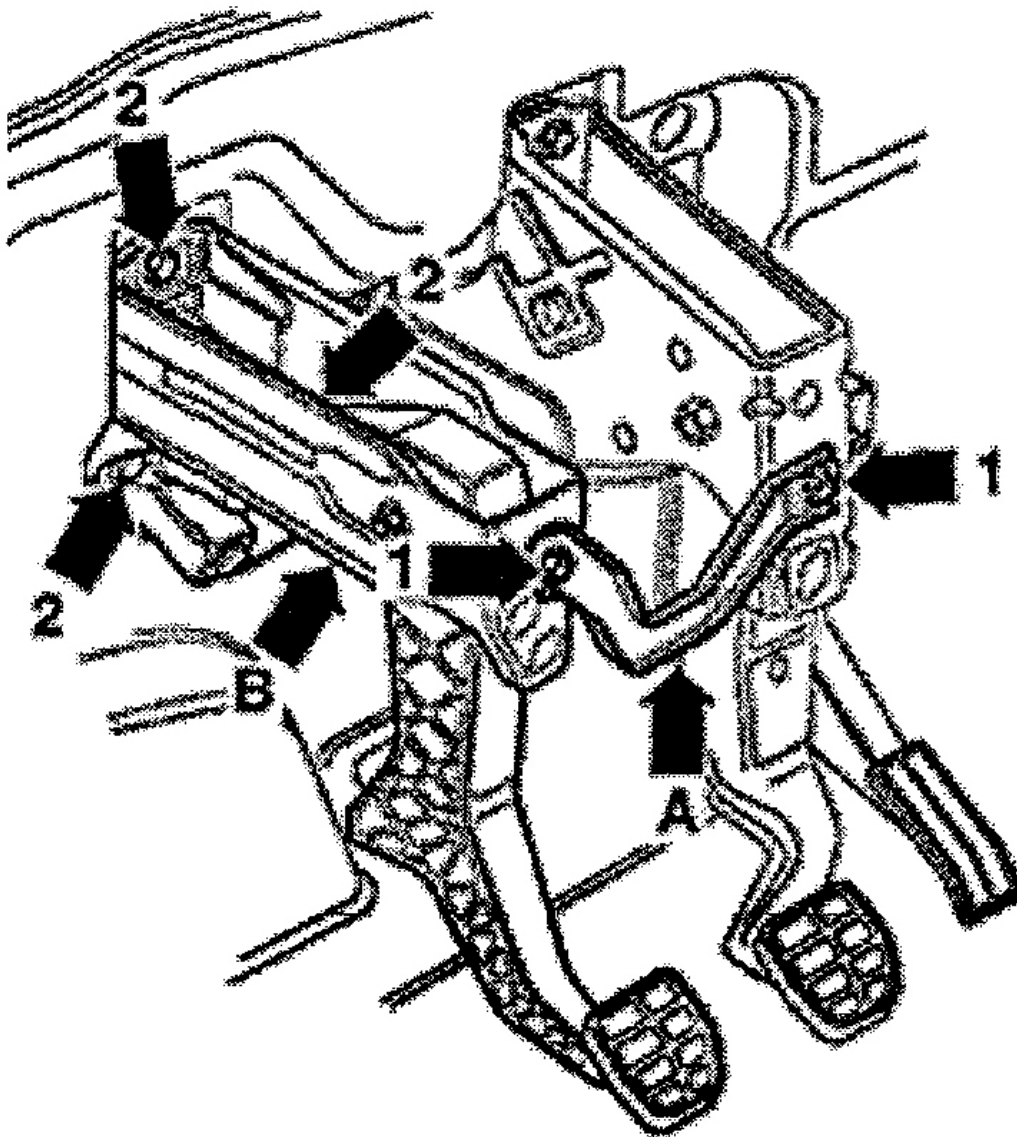
3. Remove driver's lower instrument panel cover. Turn clutch pedal switch 90 degrees to left and pull switch out from support. Pull clutch pedal lightly toward passenger compartment. Press both sides of mounting inward using Pliers (T10005). See **Fig. 19** . Separate master cylinder operating rod from clutch pedal.



G00204306

Fig. 19: Applying Pliers (T10005) To Clutch Pedal Support Mounting
Courtesy of VOLKSWAGEN UNITED STATES, INC.

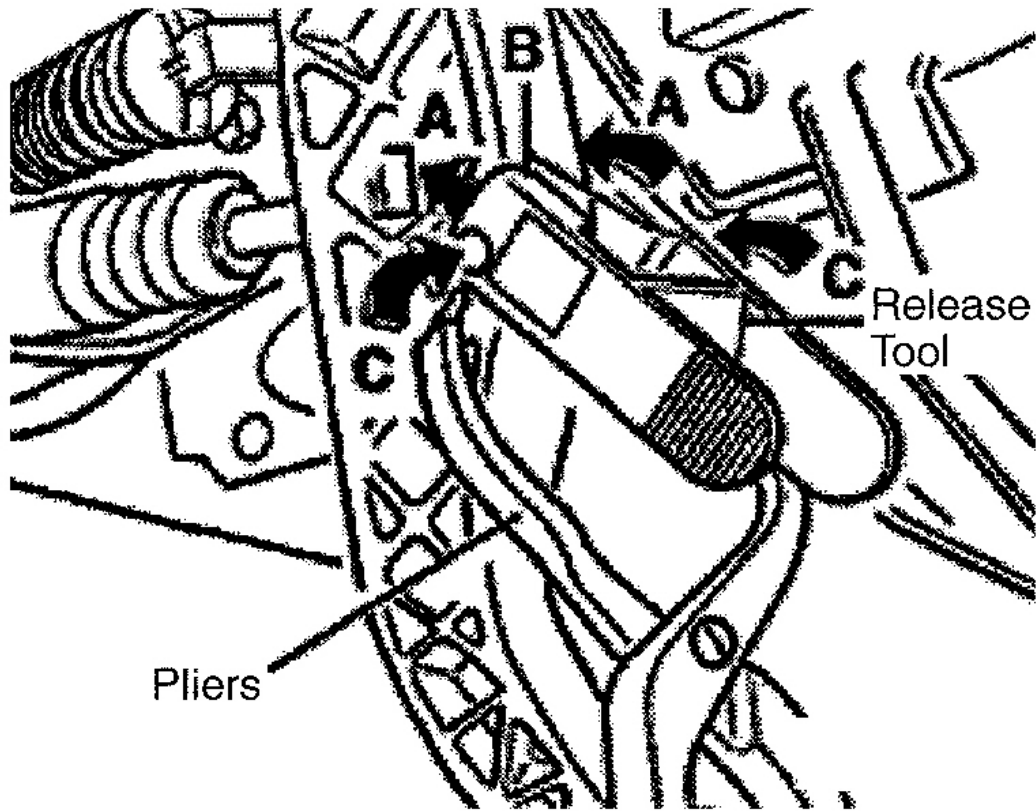
4. Remove complete clutch pedal mounting bracket by removing connecting plate (A) first (arrows 1). See **Fig. 20** . Remove securing nuts (arrow 2) for support (B). Remove mounting bracket.



G00204289

Fig. 20: Removing Clutch Pedal Mounting Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

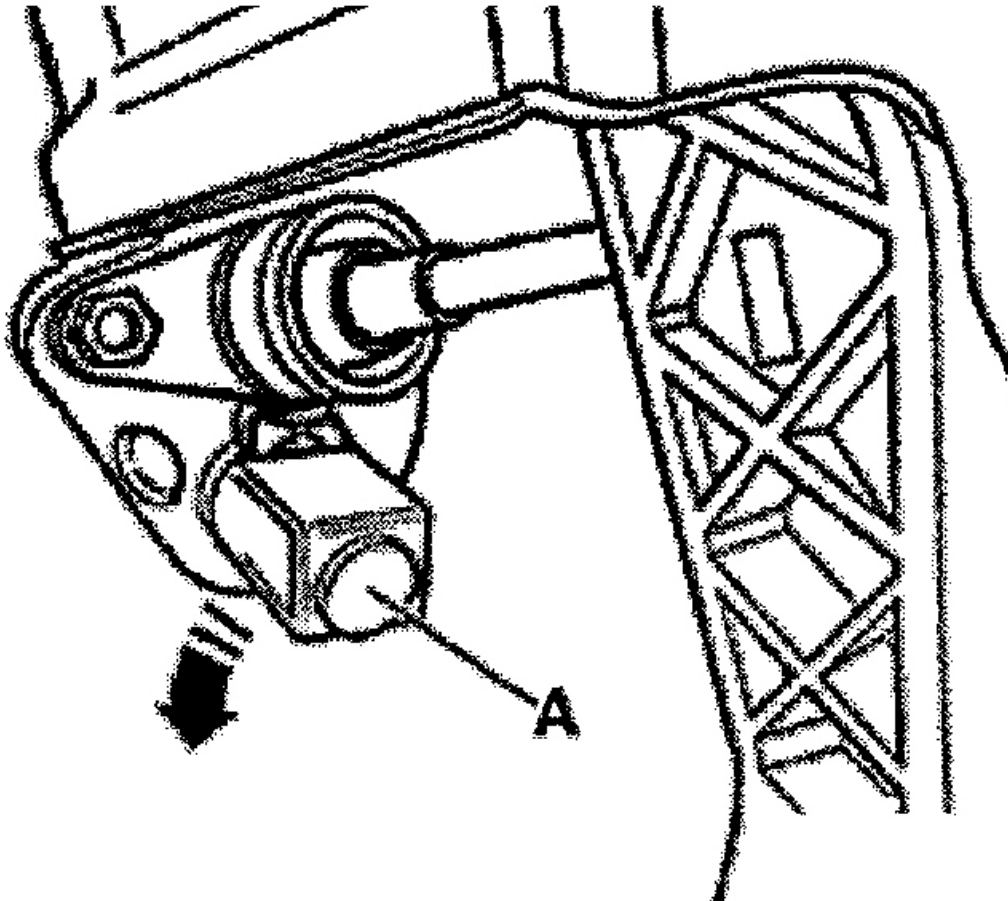
5. Separate clutch master cylinder rod from clutch pedal by, inserting Release Tool (3309) into clutch pedal cut outs (A). See **Fig. 21** . Inscription (B, top/open) on release tool points away from clutch pedal. Using pliers positioned in recesses (C), press release tool together.



G00204290

Fig. 21: Separating Master Cylinder From Clutch Pedal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

6. Turn stop (A) for clutch pedal in a counterclockwise direction and remove stop. See **Fig. 22** .

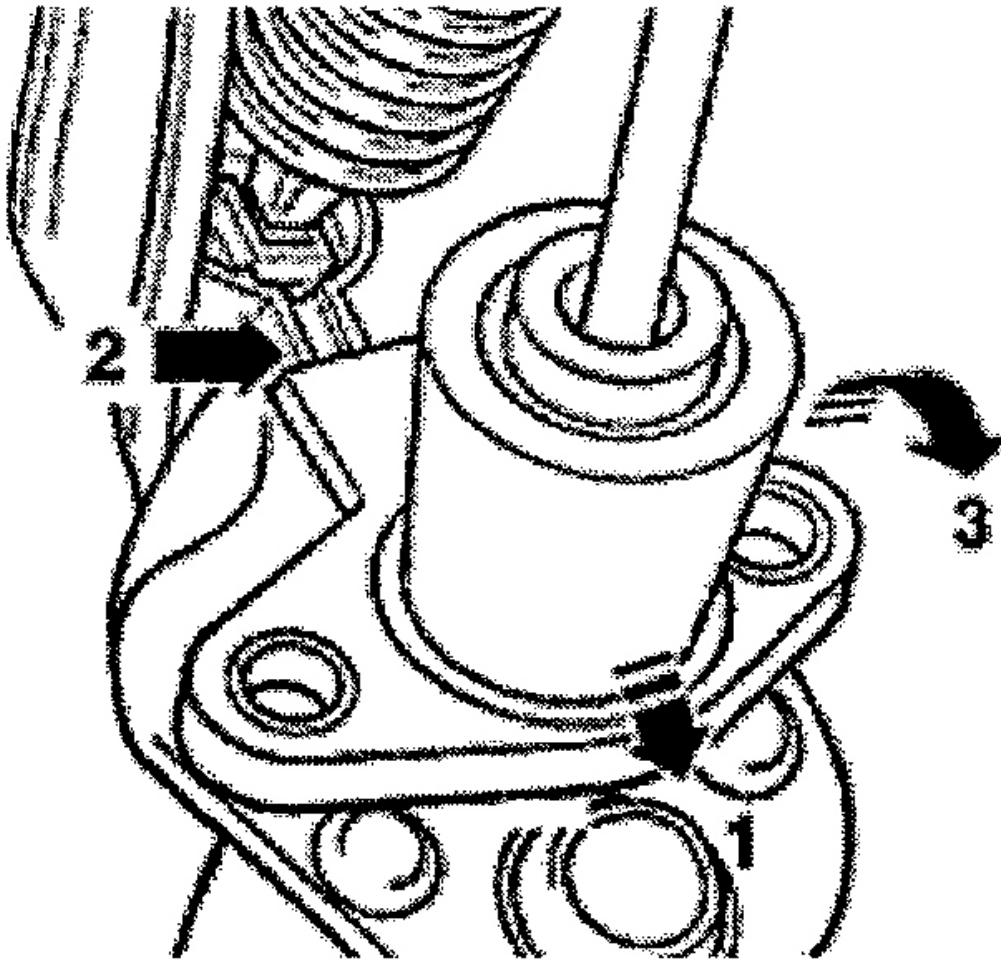


G00204291

Fig. 22: Turning Stop For Clutch Pedal

Courtesy of VOLKSWAGEN UNITED STATES, INC.

7. Push clutch master cylinder downward (arrow 1) onto stop. See **Fig. 23** . Clutch master cylinder must not be covered in upper area by overcenter spring mounting (arrow 2). Swing clutch master cylinder in direction of arrow (3) and remove from mounting bracket.

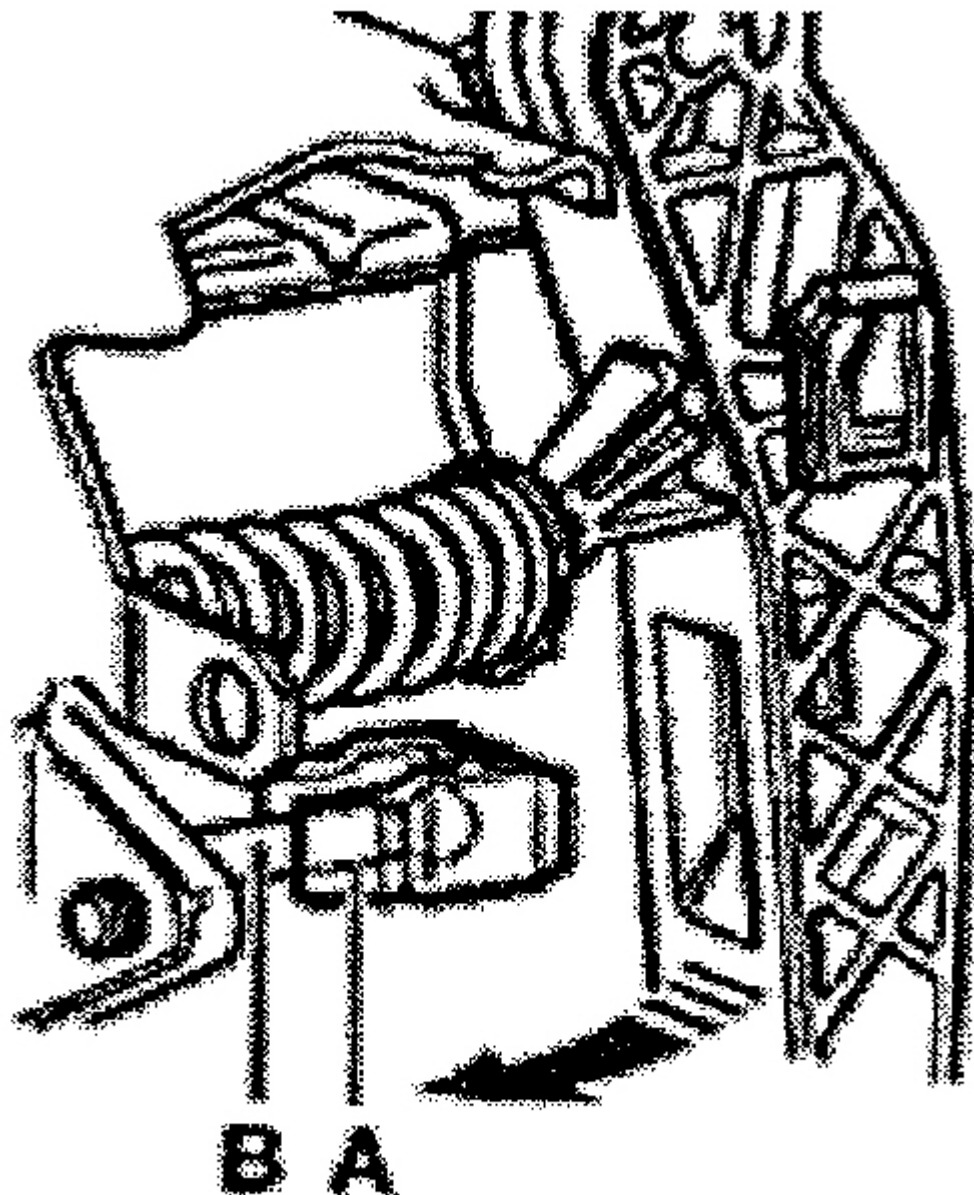


G00204292

Fig. 23: Removing Clutch Master Cylinder

Courtesy of VOLKSWAGEN UNITED STATES, INC.

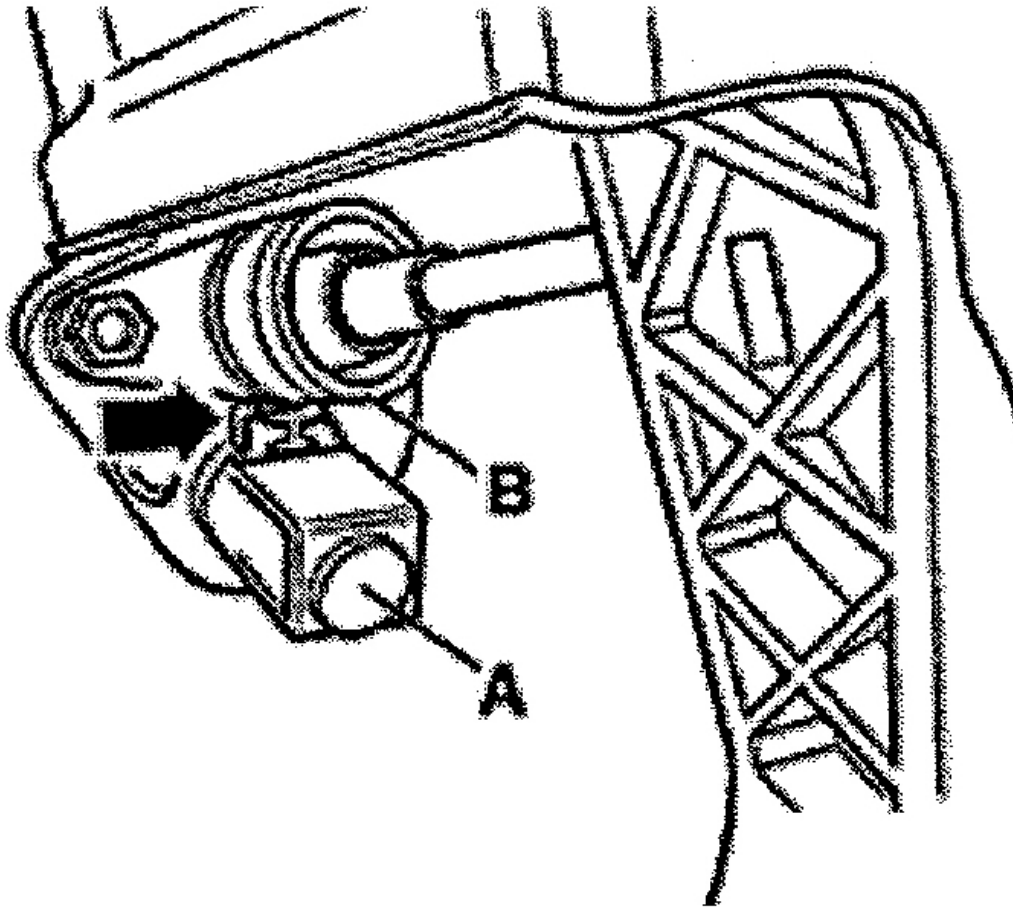
8. To install, reverse removal procedure. Install retainer (A) to clutch master cylinder operating rod (B). See **Fig. 24** . Pull piston rod out of clutch master cylinder slightly and hold using a pair of pliers. Press clutch pedal in direction of arrow to engage. Ensure retainer is installed in correct location.



G00204293

Fig. 24: Installing Retainer To Operating Rod
Courtesy of VOLKSWAGEN UNITED STATES, INC.

9. Install stop (A) for clutch pedal. Arm (arrow) points toward clutch master cylinder (B). See **Fig. 25** . Bleed clutch system after installing clutch master cylinder. See **BLEEDING** .



G00204294

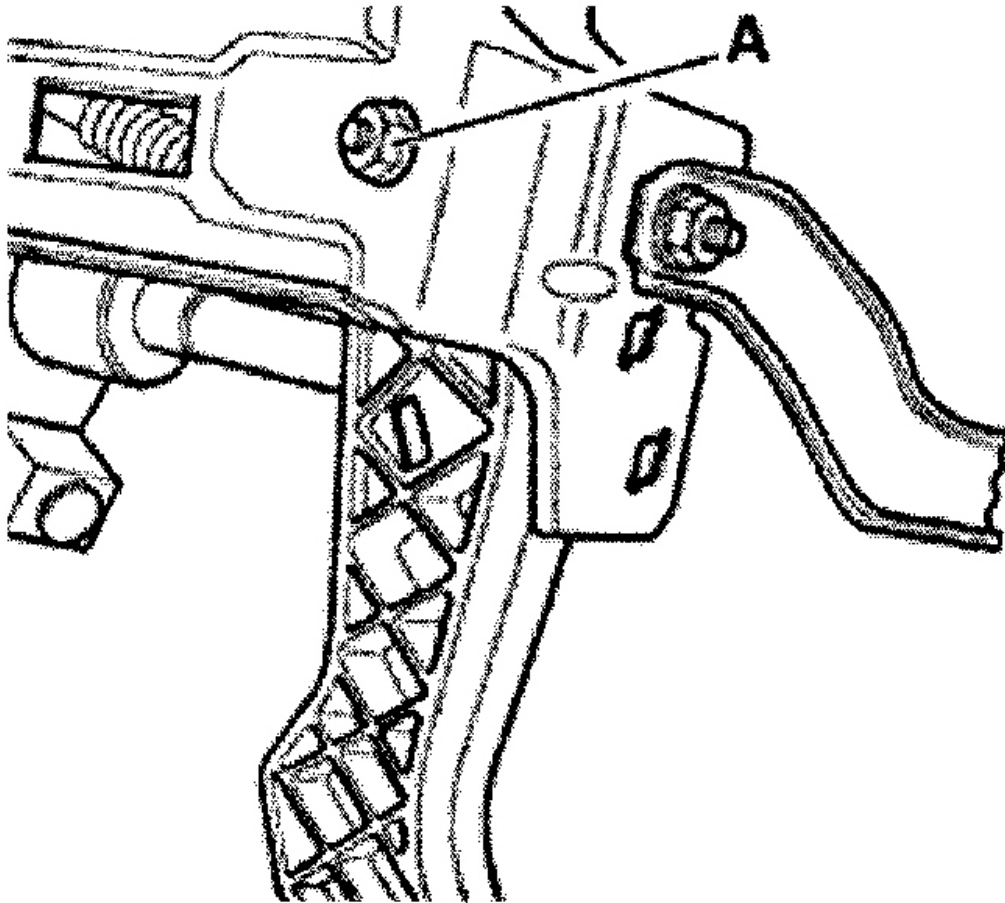
Fig. 25: Fitting Stop For Clutch Pedal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

CLUTCH PEDAL

Removal & Installation

1. Obtain anti-theft coding. With ignition switch turned to OFF position, disconnect battery negative cable. See **BATTERY DISCONNECT PRECAUTIONS** .
2. Remove cover in driver's footwell. Remove overcenter spring. See **OVERCENTER SPRING** .

3. Remove clutch pedal from clutch master cylinder, and press operating rod until it reaches engine compartment. Remove nut (A). See **Fig. 26** . Pull bolt out until clutch pedal can be removed.



G00204296

Fig. 26: Removing Clutch Pedal

Courtesy of VOLKSWAGEN UNITED STATES, INC.

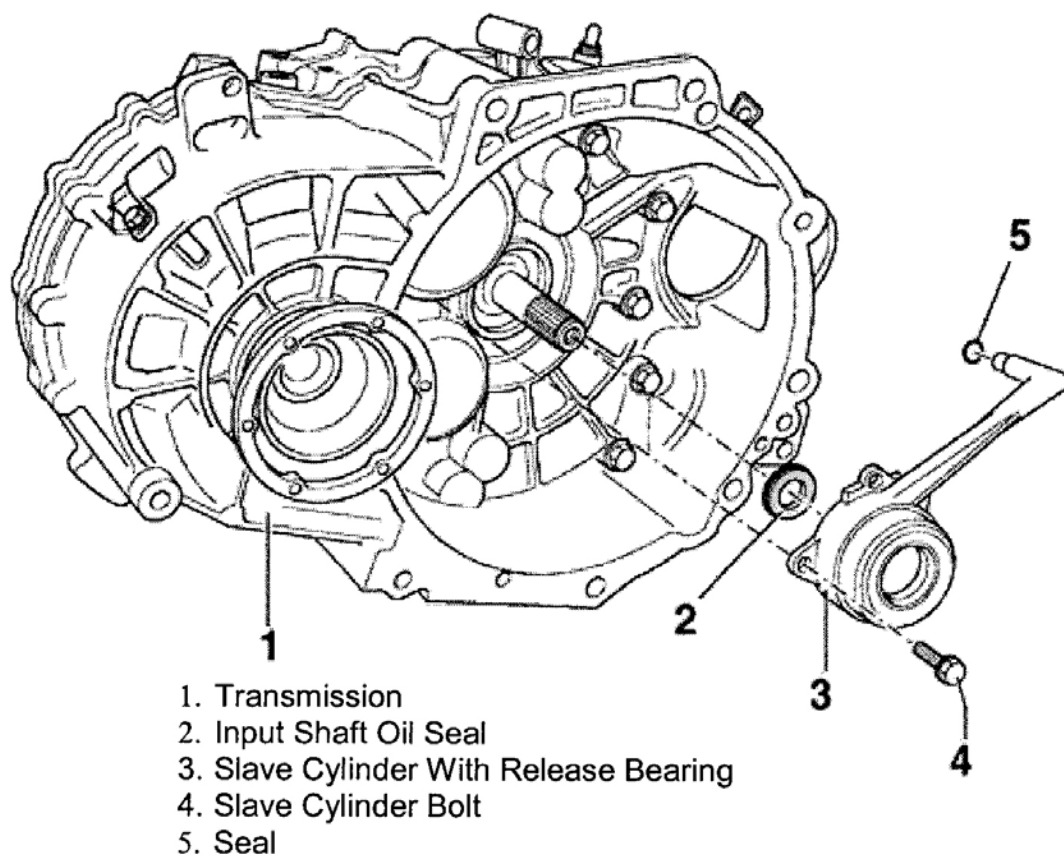
4. Pull clutch pedal lightly toward passenger compartment. Press both sides of mounting inward using Pliers (T10005). See **Fig. 19** . Separate master cylinder operating rod from clutch pedal. Push operating rod toward engine compartment until stopped.
5. To install, reverse removal procedure. Install overcenter spring. Install retainer (A) to clutch master cylinder operating rod (B). See **Fig. 25** . Press clutch pedal in direction of arrow to engage. Ensure retainer is installed in correct location. Place clutch pedal switch in mounting hole, and turn 45 degrees to right.

CLUTCH RELEASE BEARING/SLAVE CYLINDER

Removal & Installation

CAUTION: DO NOT wash out bearing. Replace noisy bearing. Release bearing and slave cylinder are an integral unit.

Removal and installation information is not available from manufacturer. Use illustration as an aid for procedure. See Fig. 27 .



G00370067

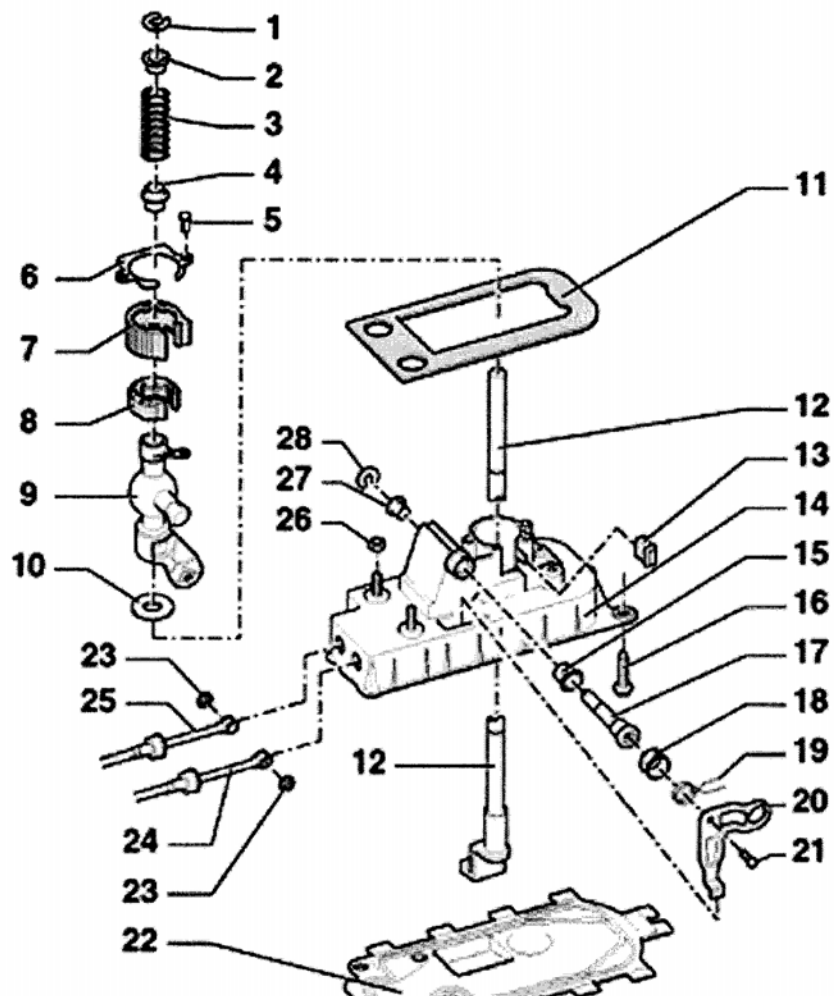
Fig. 27: Identifying Clutch Release Components
Courtesy of VOLKSWAGEN UNITED STATES, INC.

GEAR SHIFT LEVER & HOUSING

Removal & Installation

NOTE: Removal and installation information is not available from manufacturer. Use

illustration as an aid for procedure. See Fig. 28 . Note the following points when servicing.



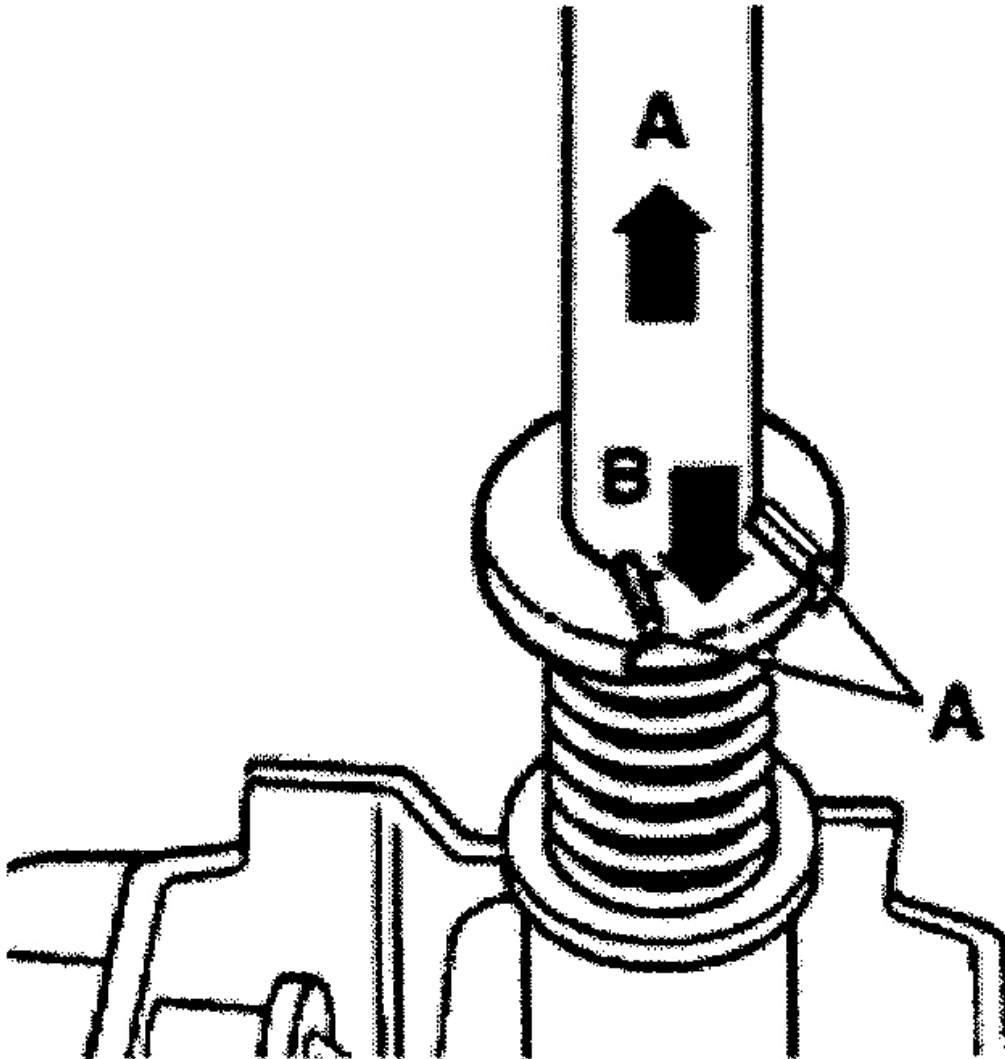
- | | |
|---------------------------------|--------------------------------|
| 1. Circlip | 15. Bushing |
| 2. Bushing | 16. Selector Housing Bolt |
| 3. Spring | 17. Fulcrum Pin |
| 4. Bushing | 18. Guide Bushing |
| 5. Cover Plate Bolt | 19. Spring |
| 6. Cover Plate | 20. Gate Selector Bracket |
| 7. Damper | 21. Gate Selector Bracket Bolt |
| 8. Bearing Shell | 22. Base Plate (Repace) |
| 9. Gear Shift Guide | 23. Lock Washer |
| 10. Damping Washer | 24. Gate Selector Cable |
| 11. Gasket | 25. Gear Selector Cable |
| 12. Transmission Selector Lever | 26. Nut |
| 13. Damper | 27. Bushing |
| 14. Selector Housing | 28. Lockwasher |

G00370031

Fig. 28: Exploded View Of Gear Shift Lever & Housing

Courtesy of VOLKSWAGEN UNITED STATES, INC.

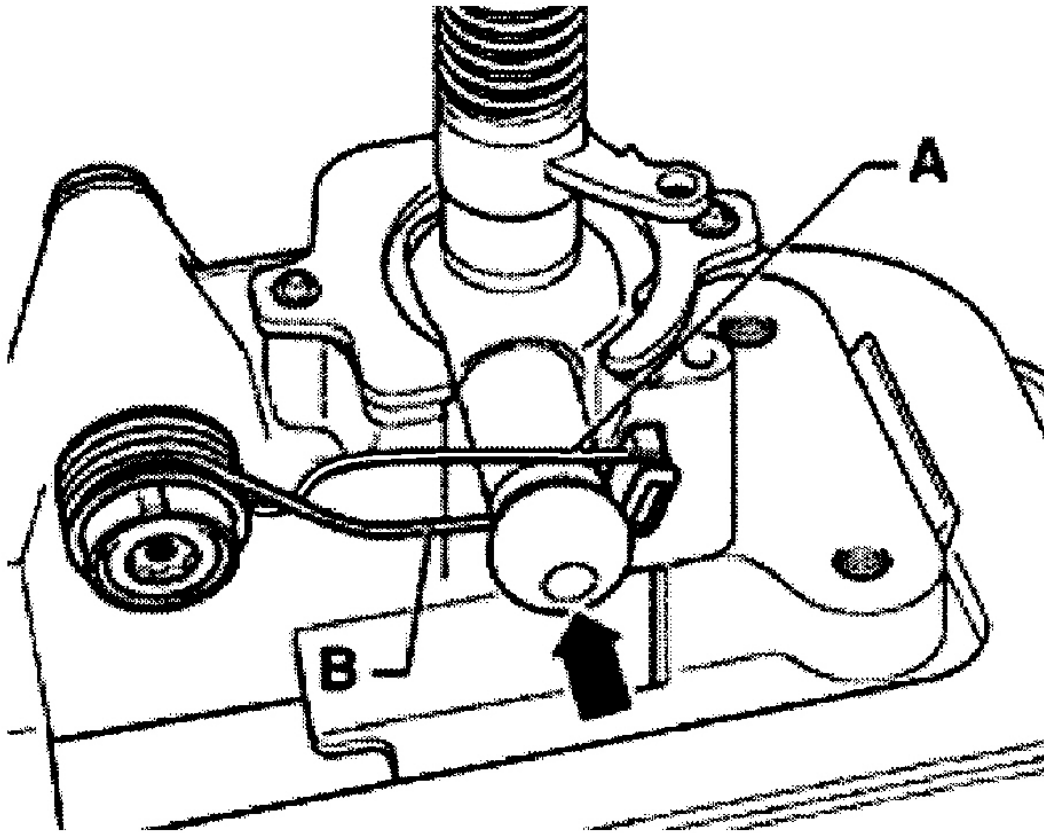
1. To remove and install circlip, use a screwdriver to pull gear lever in direction of arrow (A), while pushing down spacer bushing onto stop, in direction of arrow (B). See **Fig. 29** . DO NOT tilt spacer bushing when pushing down.



G00370029

Fig. 29: Removing & Installing Circlip
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2. Carefully release pressure at groove in gear lever for circlip. Insert spring so spring extension (A) lies above pin (arrow). See **Fig. 30** .

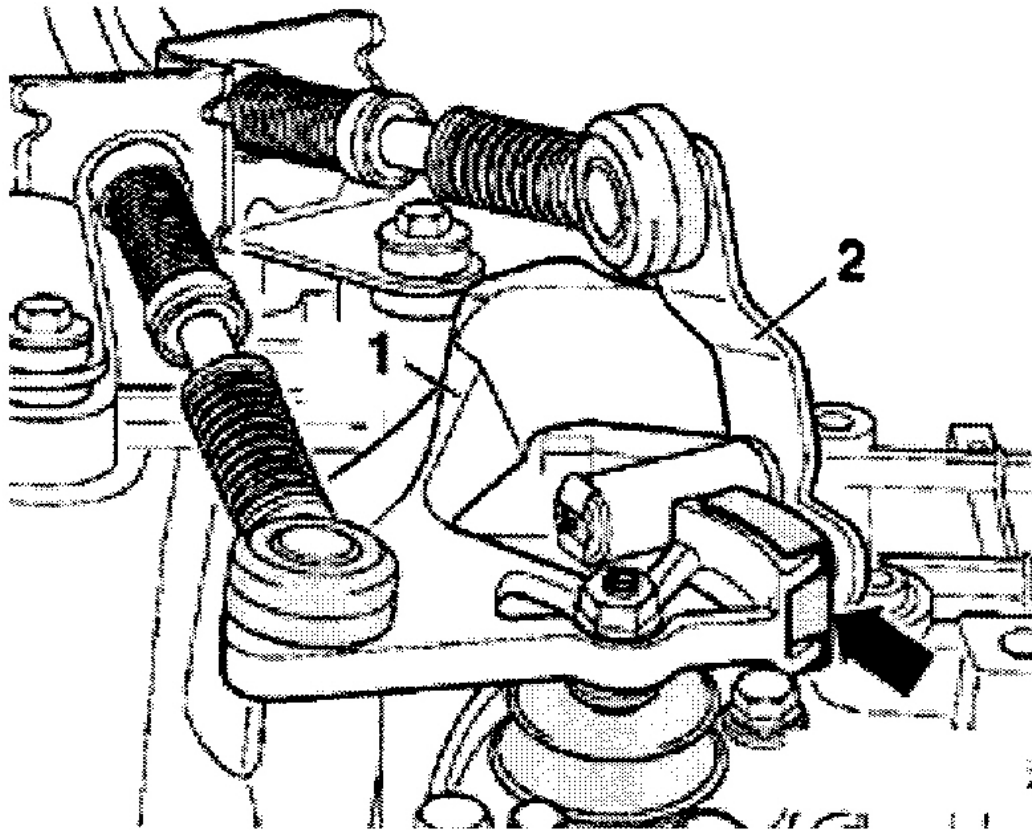


G00370032

Fig. 30: Installing Spring

Courtesy of VOLKSWAGEN UNITED STATES, INC.

3. Pull spring extension (B) down so it reaches below pin (arrow). Install transmission selector lever/relay lever as shown. See **Fig. 31** . Relay lever (2) locates in guide rail of gear selector lever via shoe (arrow). Lubricate all mountings and sliding surfaces with Polyurea grease (G 000 450 02). Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS** .



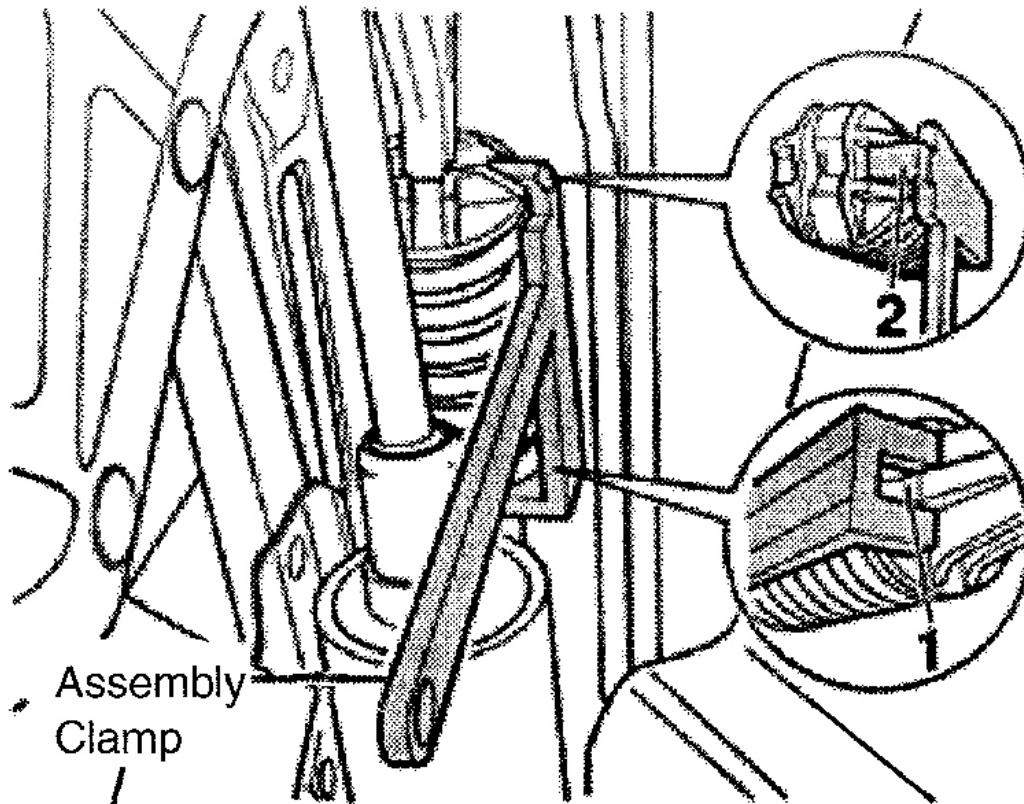
- 1 - Gear selector lever
With balance weight
- 2 - Relay lever
Locates in guide rail
of gear selector lever
via shoe (arrow)

G00370068

Fig. 31: Installation Position Of Transmission Selector Lever/Relay Lever
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation

1. Remove driver's lower instrument panel cover. Install Assembly Clamp (T10111) from right side, onto overcenter spring. See **Fig. 32** . Ensure assembly clamp seats correctly on overcenter spring. Clamp must be positioned on rear part of overcenter spring so claws fit over bridge (1).

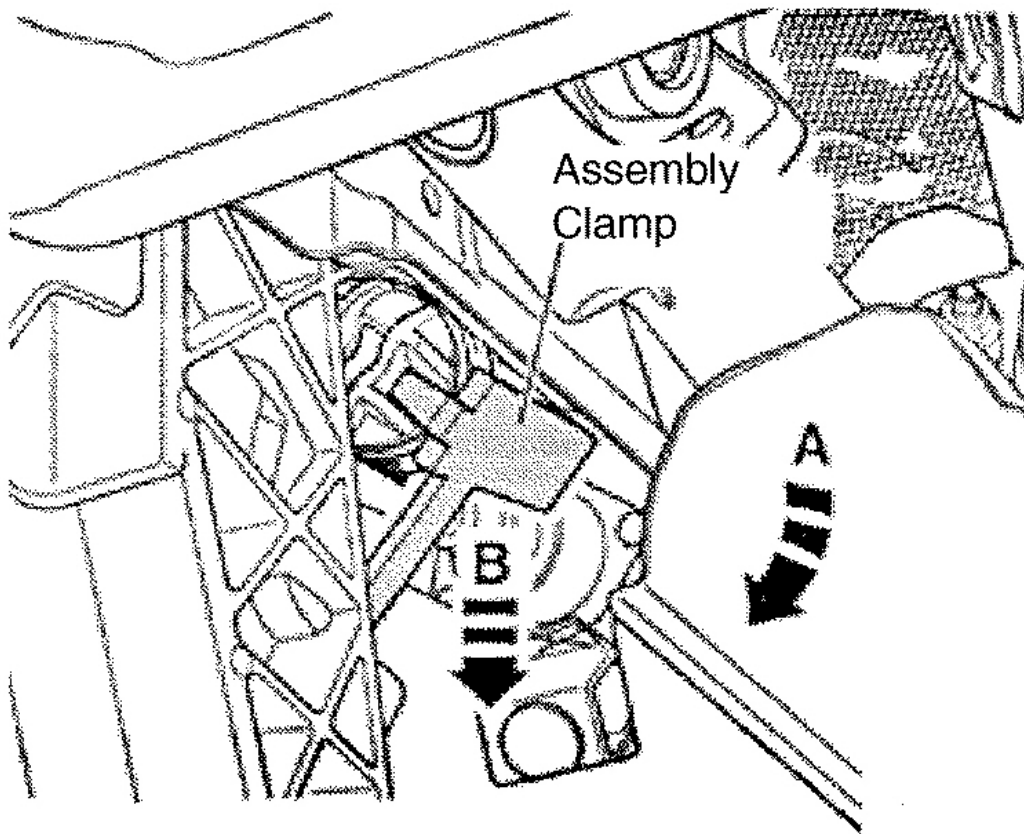


G00204298

Fig. 32: Installing Assembly Clamp

Courtesy of VOLKSWAGEN UNITED STATES, INC.

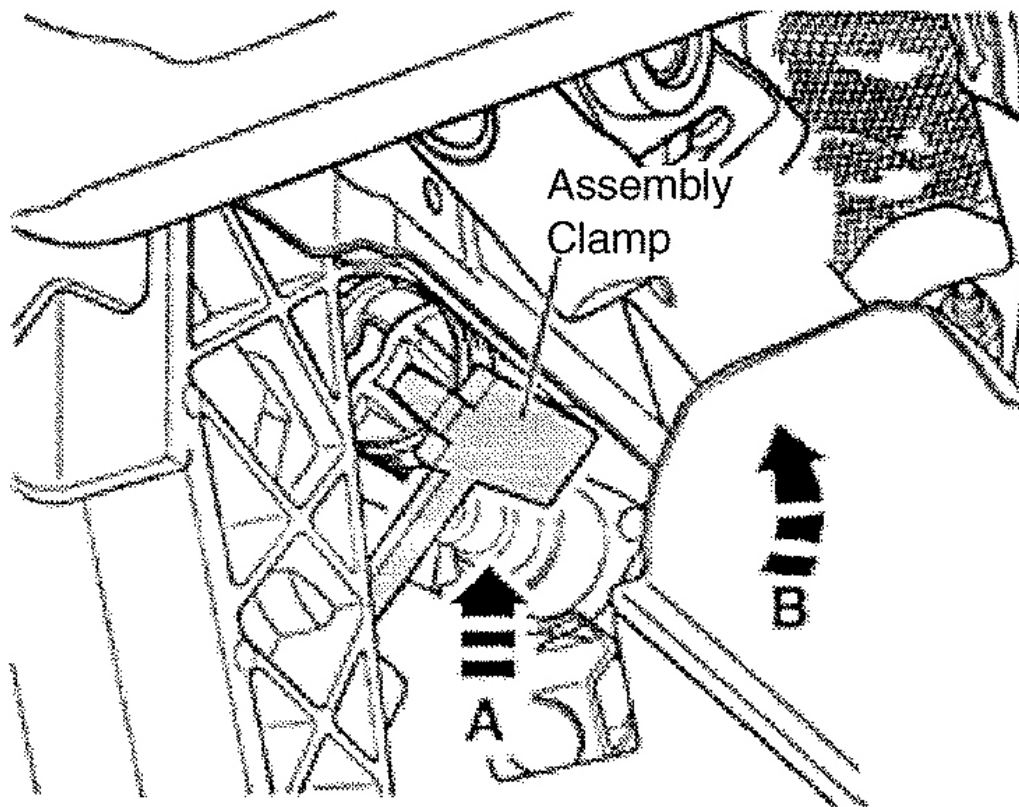
2. Press clutch pedal lightly toward bulkhead. Hook tab (2) of assembly clamp into cutout of overcenter spring. See **Fig. 32** . Press clutch pedal as far as possible toward bulkhead until overcenter spring can be removed downward out of mountings on bearing bracket and clutch pedal. Bring clutch pedal to rest position.
3. Turn overcenter spring together with assembly clamp in direction of arrow (A) and take out downward in direction of arrow (B). See **Fig. 33** .



G00204299

Fig. 33: Turning Overcenter Spring & Clamp
Courtesy of VOLKSWAGEN UNITED STATES, INC.

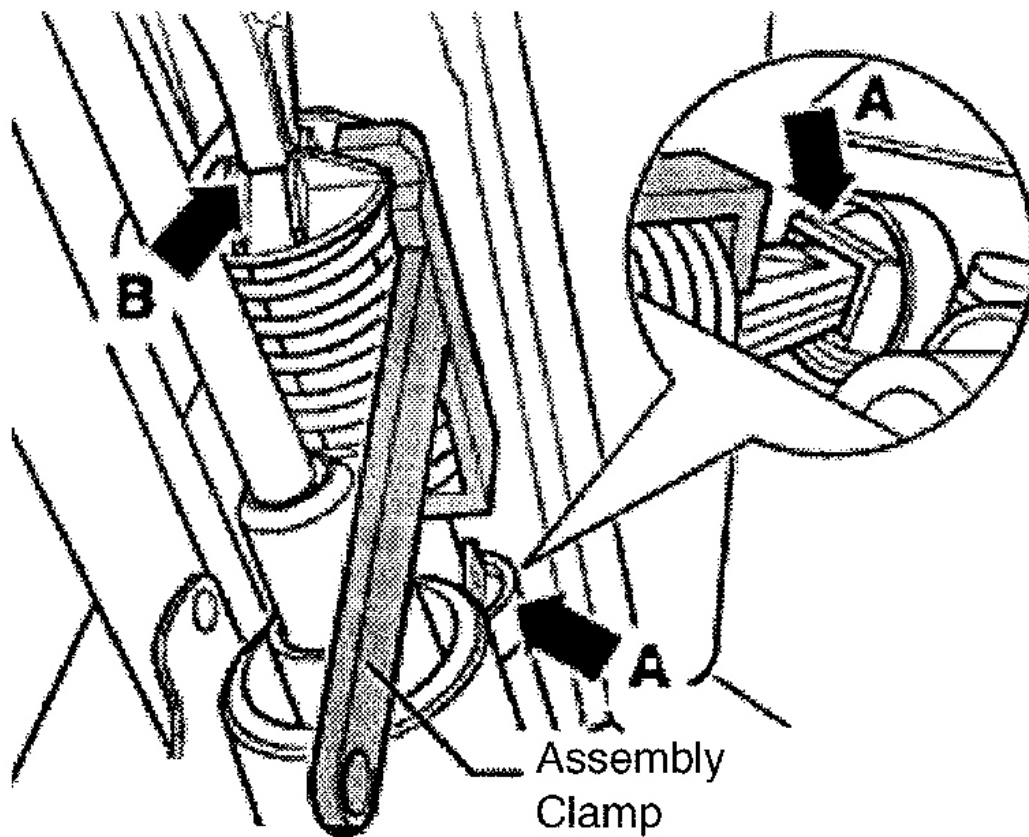
4. To install, pull clutch pedal into passenger compartment. Insert overcenter spring with assembly clamp (T10111) upward in direction of arrow (A) into support. See **Fig. 34** . Then turn in direction of arrow (B).



G00204300

Fig. 34: Inserting Overcenter Spring Into Bearing Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. Insert overcenter spring into rear mounting first (A). See **Fig. 35** . Operate clutch pedal until overcenter spring seats on mounting tab (B) of clutch pedal. Remove assembly clamp while bringing clutch pedal to rest position. Install driver's lower instrument panel cover.



G00204301

Fig. 35: Inserting Overcenter Spring Into Rear Mounting
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

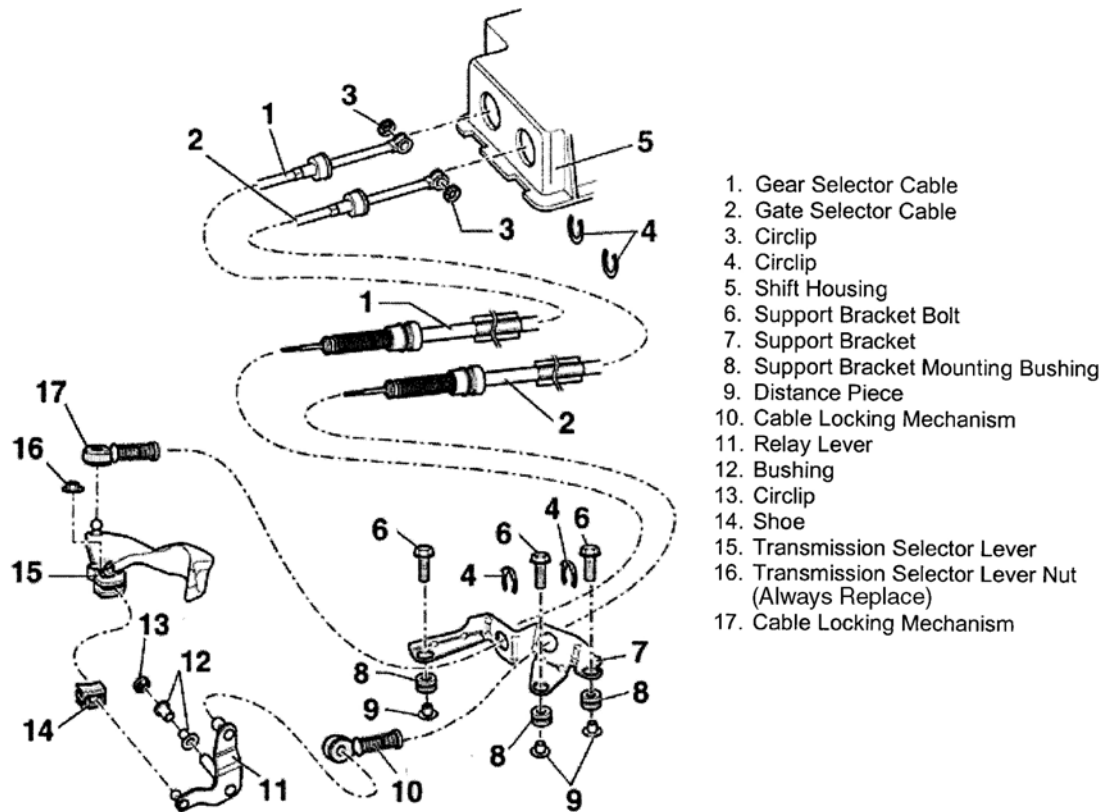
SELECTOR CABLES

Removal & Installation

Removal and installation information is not available from manufacturer. Use illustration as an aid for procedure. See **Fig. 36** . Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS** .

Install transmission selector lever (item 15) so master spline aligns with selector shaft. See **Fig. 36** . Ensure Transmission Selector Lever/Relay Lever is installed correctly. See **Fig. 31** .

After installing, adjust gear selector mechanism. See **SELECTOR MECHANISM** under ADJUSTMENTS.



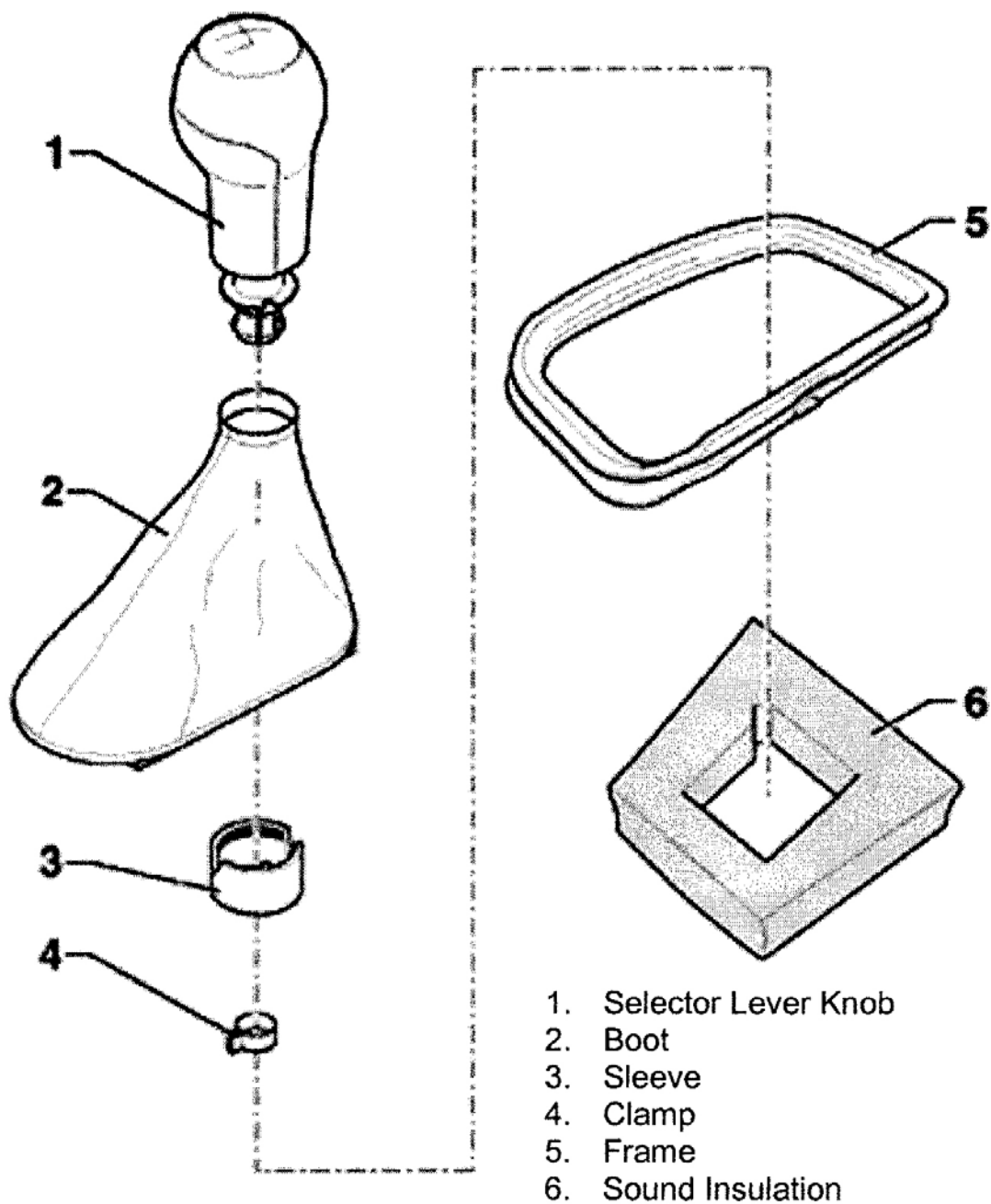
G00370069

Fig. 36: Exploded View Of Selector Cables
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

SELECTOR LEVER KNOB & BOOT

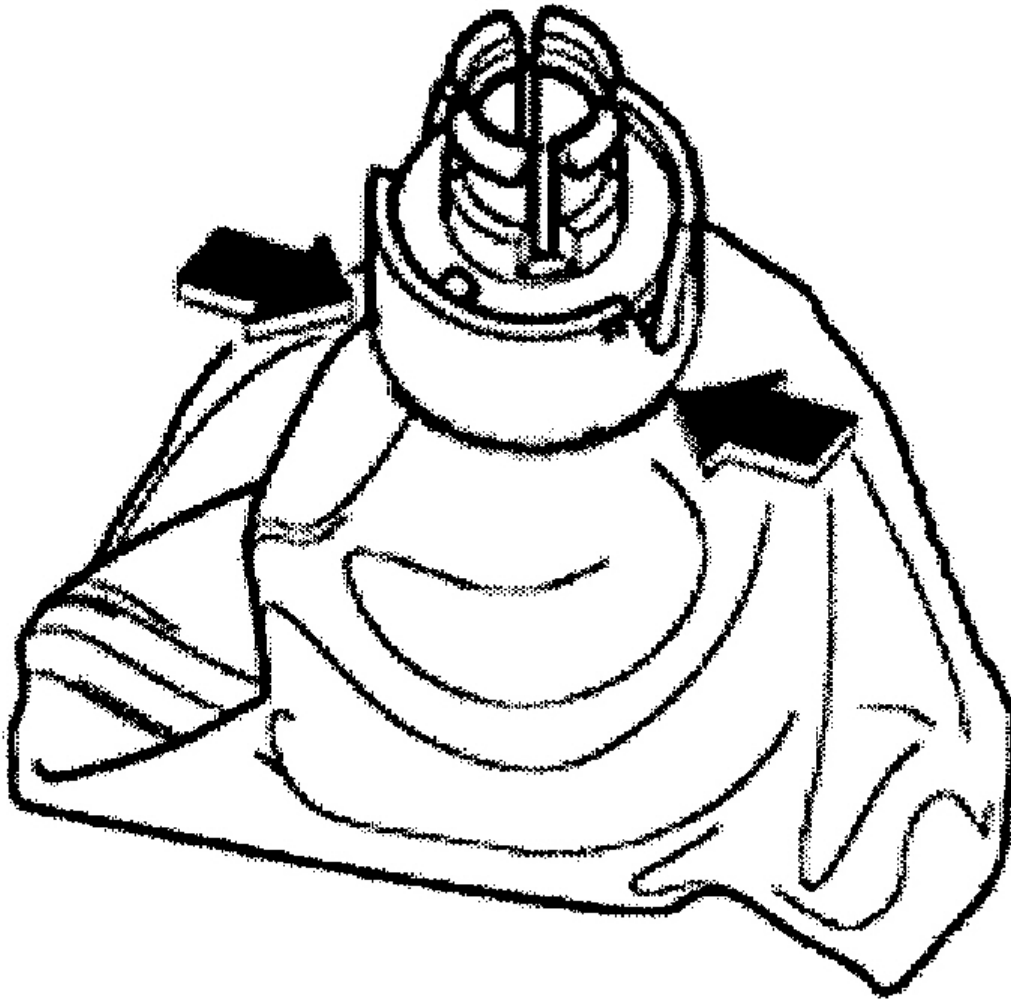
Removal & Installation

Use illustration as an aid for procedure. See **Fig. 37** . Turn boot inside out. Using a screwdriver, carefully pry clamping sleeve (arrow). See **Fig. 38** . Pull gear shift knob out. Insert gear shift knob in cover. Push clamping sleeve onto gear shift knob, and engage. Install gear shift knob and boot together.



G00370037

Fig. 37: Exploded View of Selector Lever Knob & Boot
Courtesy of VOLKSWAGEN UNITED STATES, INC.



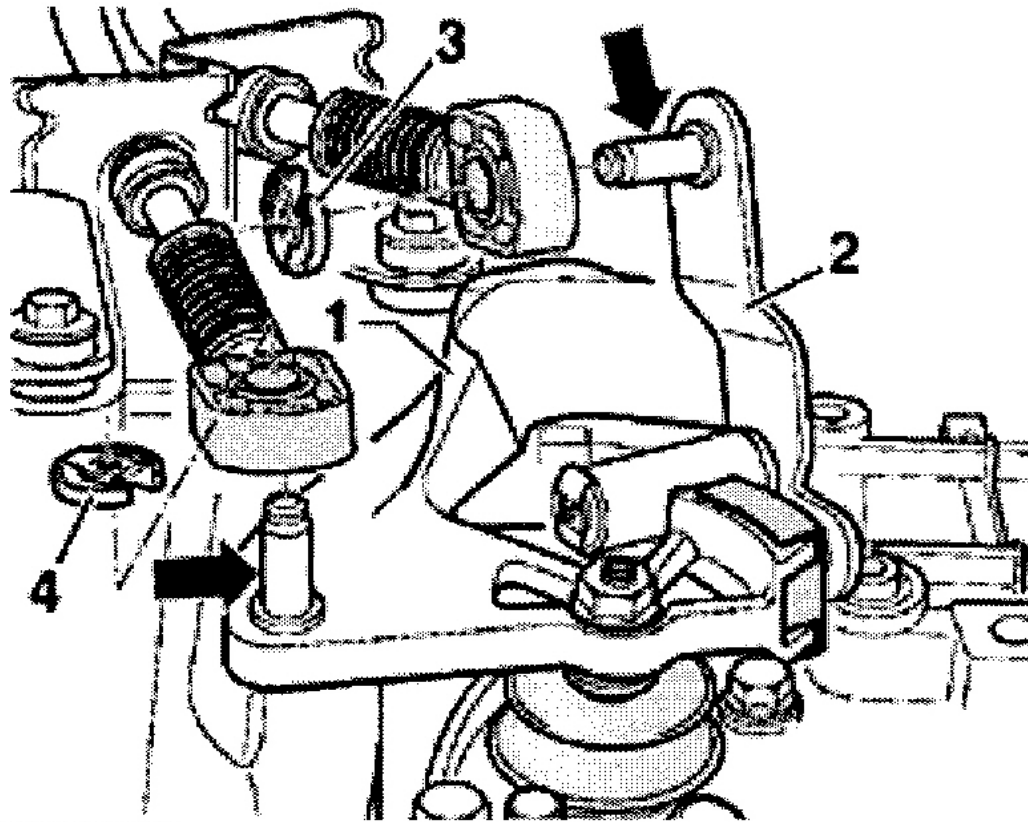
G00370036

Fig. 38: Separating Cover From Gear Shift Knob
Courtesy of VOLKSWAGEN UNITED STATES, INC.

SELECTOR MECHANISM

Removal & Installation

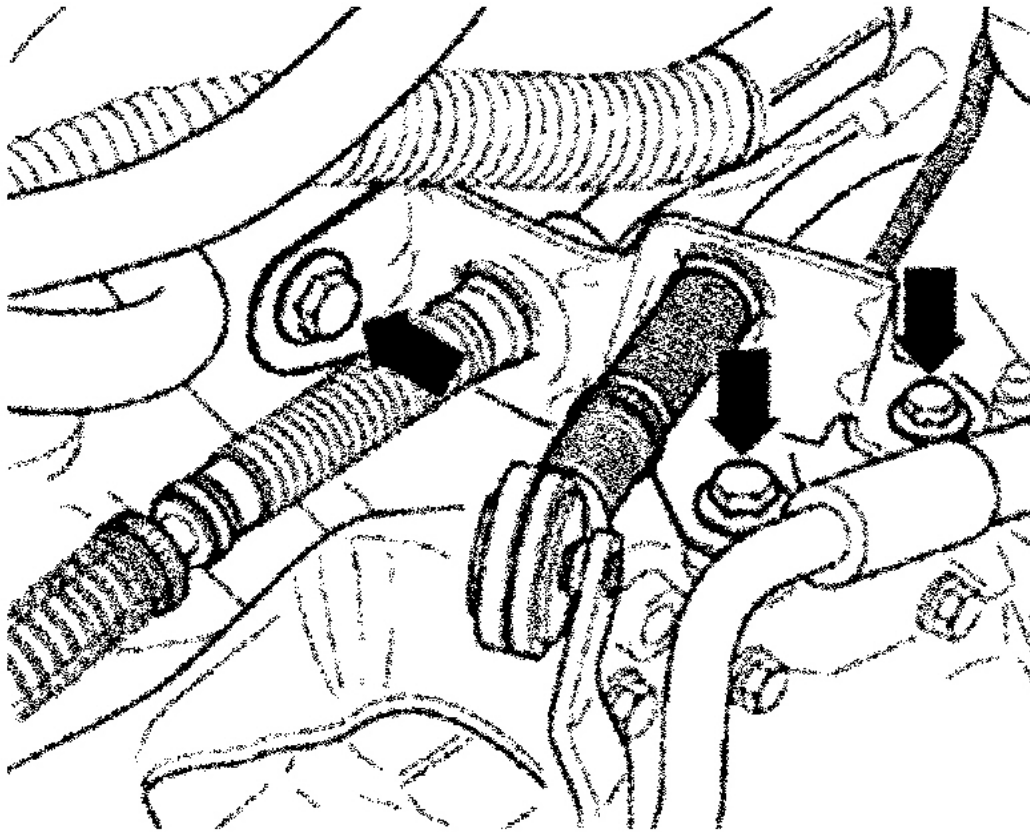
1. Remove securing clip (3) for gear selector cable, from gear selector lever (1). See **Fig. 39** . Remove securing clip (4) for gate selector cable from relay lever (2). Pry gate selector cable and gear selector cable off pin (arrows).



G00370070

Fig. 39: Removing Gate & Gear Selector Cables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2. Remove cable support bracket from transmission (arrows). See **Fig. 40** . If necessary, unclip hose at cable support bracket first.

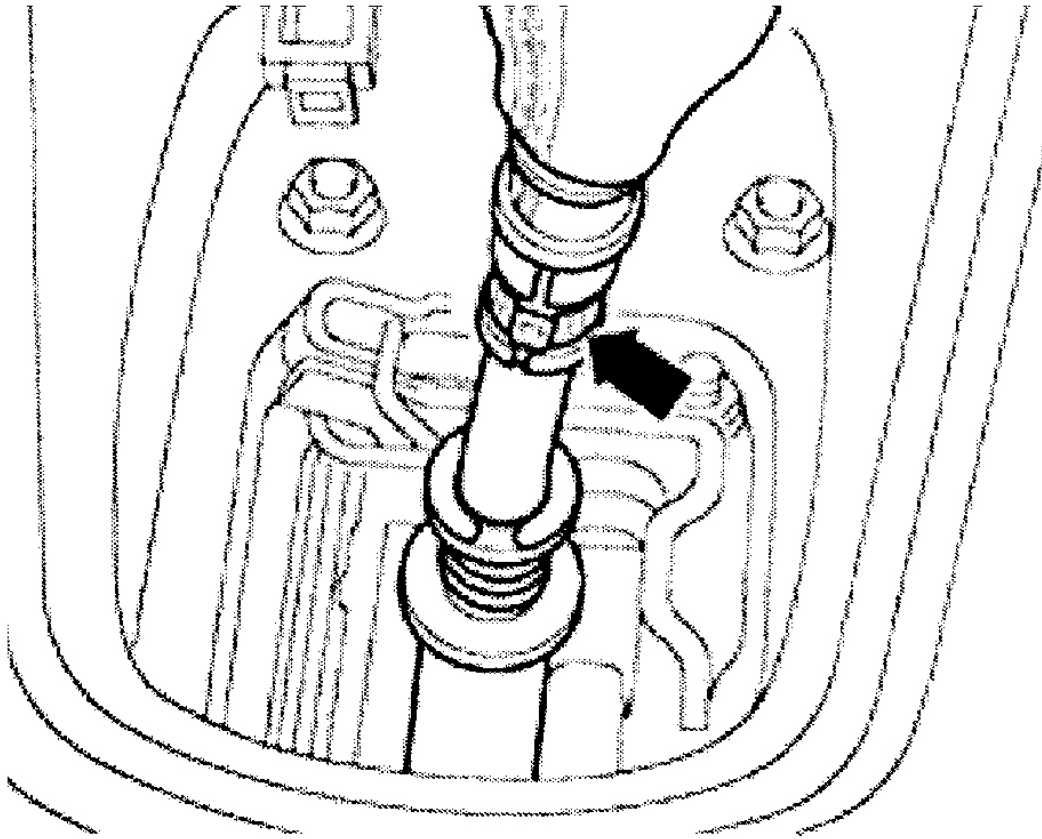


G00370109

Fig. 40: Removing Cable Support Bracket

Courtesy of VOLKSWAGEN UNITED STATES, INC.

3. Carefully pry cover off center console (arrows). See **Fig. 9** . Pull cover to rear off center console. Remove sound insulation.
4. Destroy clip (arrow), and pull gear shift knob off with cover. See **Fig. 41** .

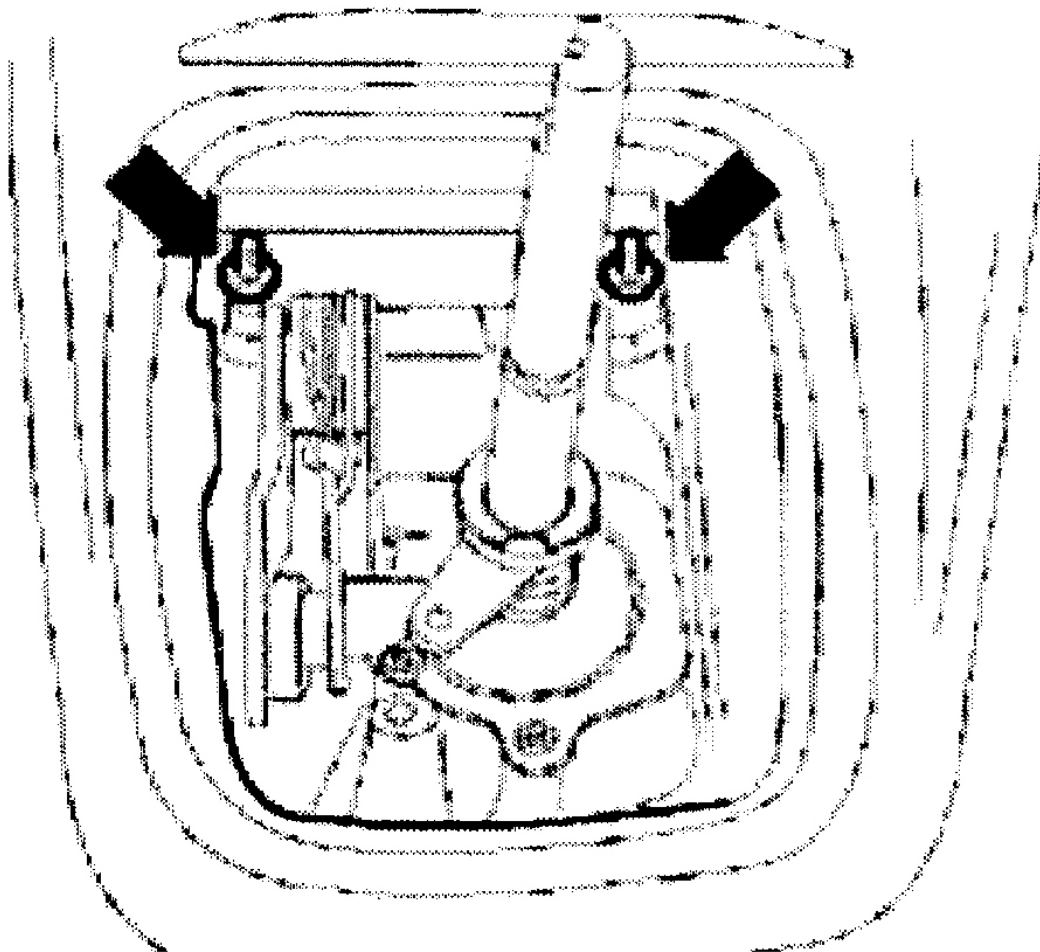


G00370005

Fig. 41: Locating Gear Shift Clip

Courtesy of VOLKSWAGEN UNITED STATES, INC.

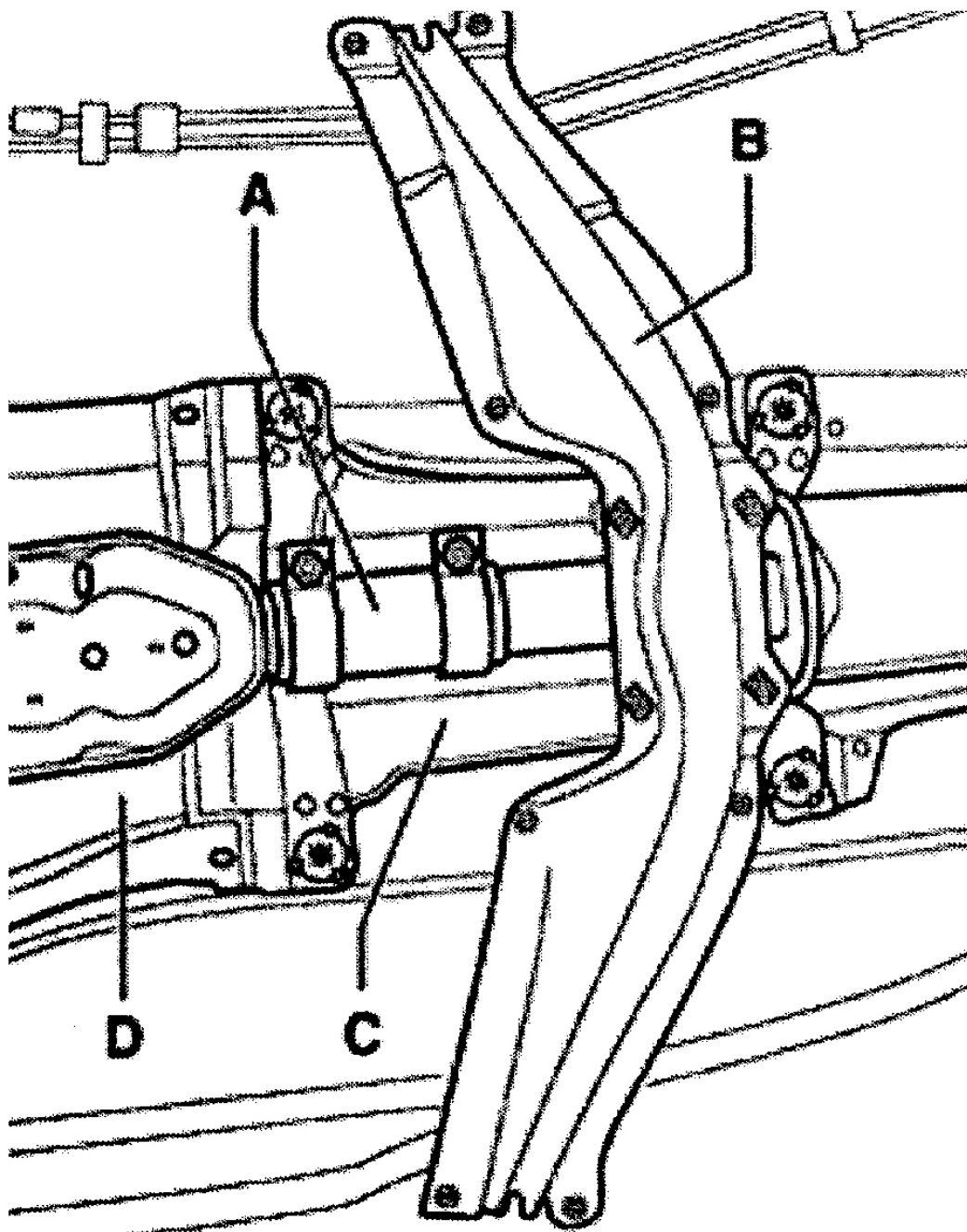
5. Remove gear lever housing front securing nuts (arrows). See **Fig. 42** .



G00370046

Fig. 42: Removing Front Gear Lever Housing Securing Nuts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

6. Separate front exhaust pipe (A). See **Fig. 43** . Remove cross support (B) below exhaust system. See **Fig. 55** . Loosen heat shield (C), in forward area. Remove heat shield (D). Unbolt selector housing from body. Swing gear lever housing down, and remove with selector cables.

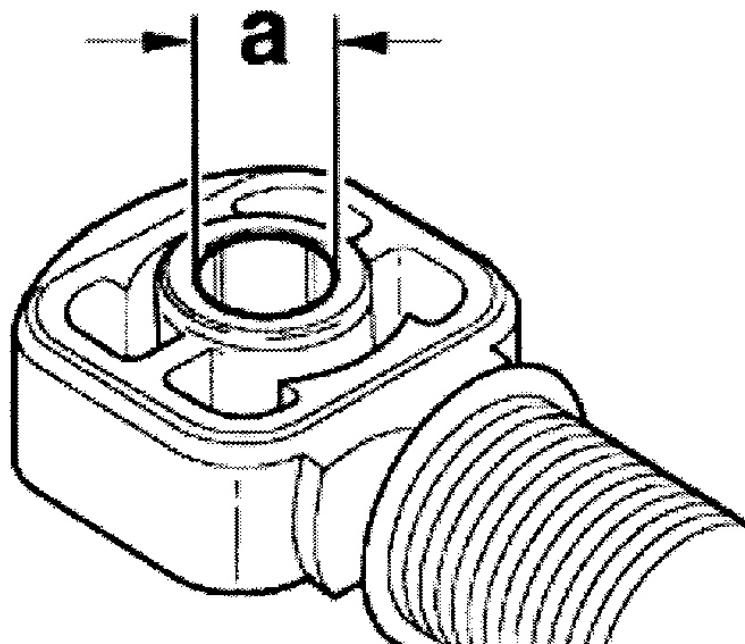


G00370042

Fig. 43: Removing Cross Support & Heat Shield
Courtesy of VOLKSWAGEN UNITED STATES, INC.

7. To install, reverse removal procedure. Cable locks have holes for securing onto gear selector lever or

relay lever. Holes in cable locks have various diameters. See **Fig. 44** . Cable locks no longer need to be replaced following disassembling.

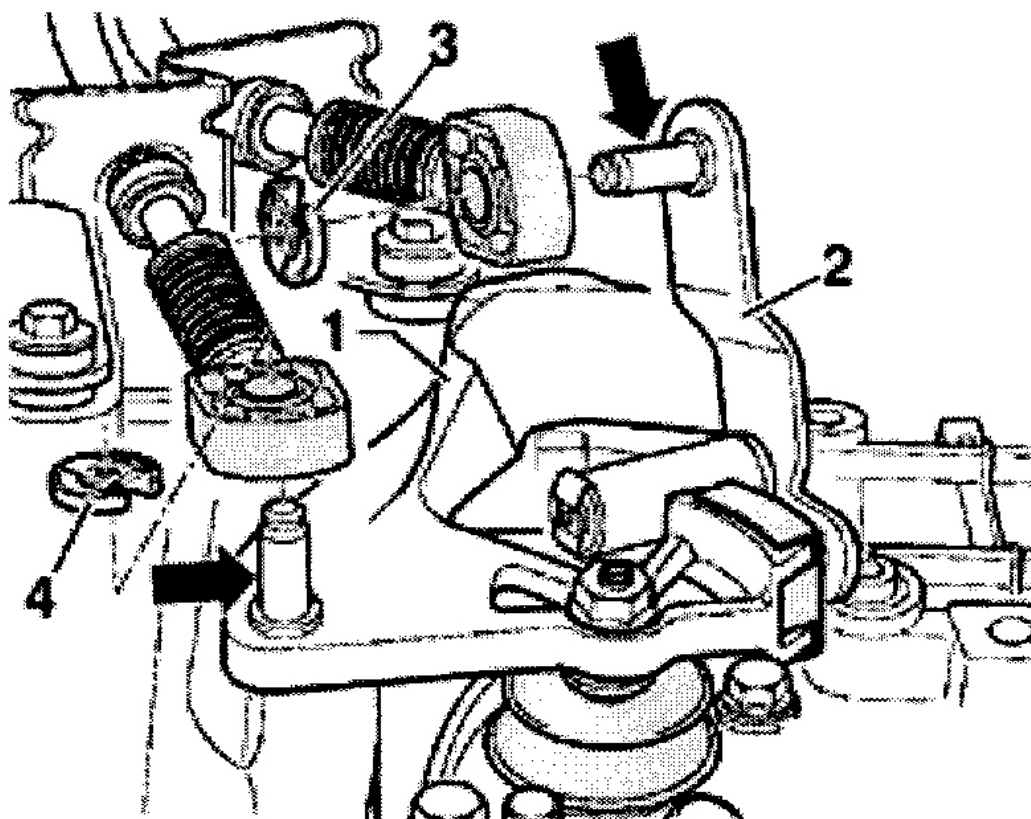


Cable lock for:	Dimension "a"
Gear selector cable to gear change lever	10 mm
Gate selector cable to relay lever	8 mm

G00370049

Fig. 44: Identifying Cable Lock Allocation
Courtesy of VOLKSWAGEN UNITED STATES, INC.

8. Spread a small quantity of Polyurea grease (G 000 450 02) on pins (arrows) of gear change lever (1) and relay lever (2). See **Fig. 45** . Always replace securing clips (3 and 4) after disassembling. Secure gear selector cable with securing clip (3) and gate selector cable with securing clip (4).



G00370072

Fig. 45: Installing Gear & Gate Selector Cable Clips
Courtesy of VOLKSWAGEN UNITED STATES, INC.

9. Adjust selector mechanism. See **SELECTOR MECHANISM** under ADJUSTMENTS. Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS**.

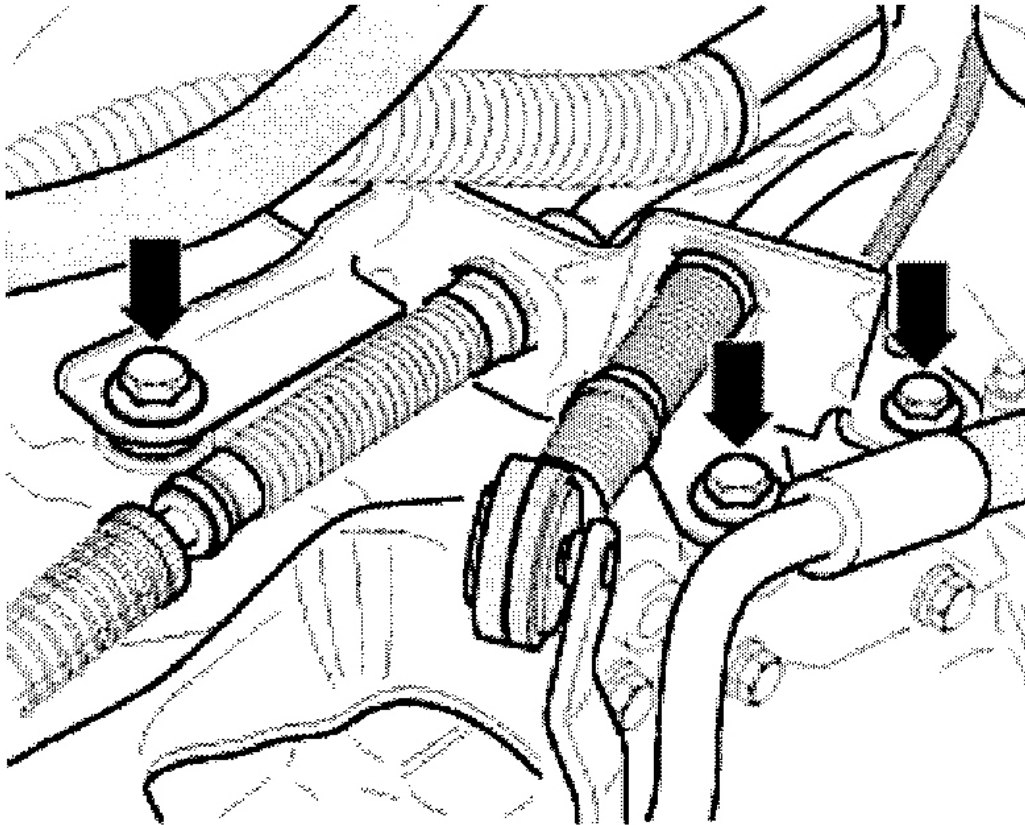
TRANSMISSION

CAUTION: Turn ignition switch to OFF position. Before disconnecting negative battery terminal, obtain anti-theft radio security code. Disconnect negative battery terminal. After reconnecting battery, re-code and check operation of anti-theft radio.

Removal

1. Remove engine cover. Turn ignition switch to OFF position. Disconnect negative battery cable. See **BATTERY DISCONNECT PRECAUTIONS**.

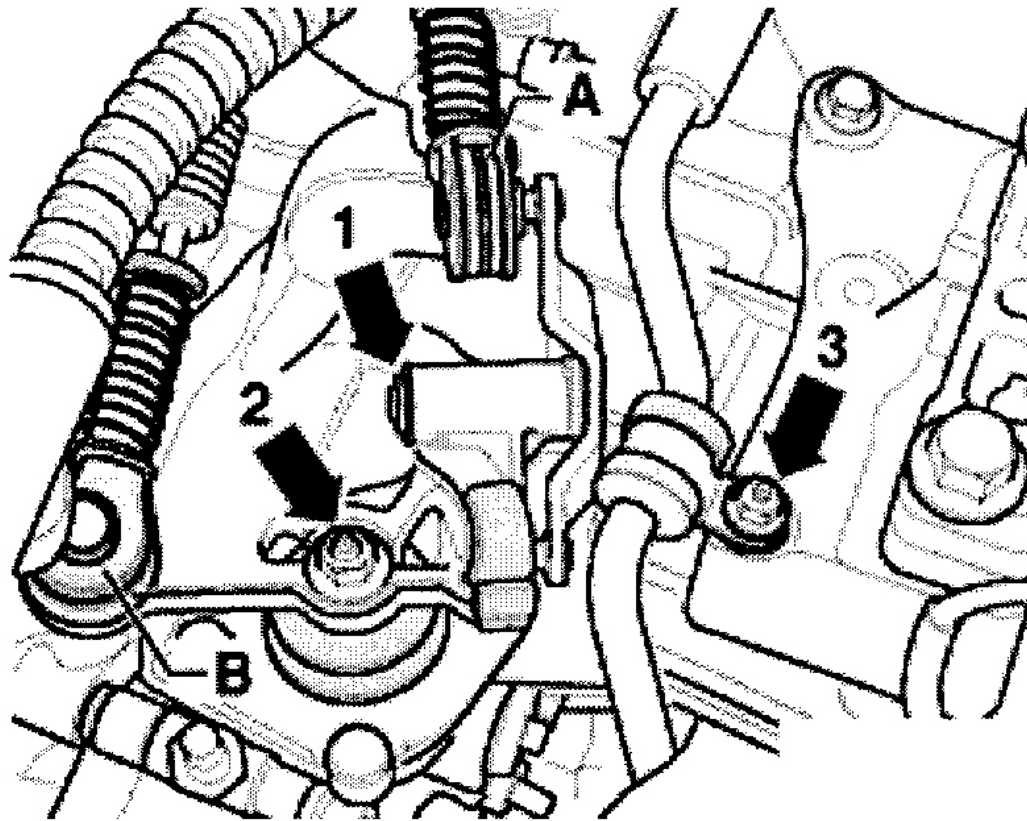
2. Remove battery and battery carrier. Remove intake hose (1), connector (2) and vacuum hose (3) from mass air flow sensor. See **Fig. 17** . Remove complete air cleaner assembly housing by removing bolts (4 and 5). Remove intake hose (1).
3. Remove cable support bracket from transmission (arrow). See **Fig. 46** .



G00370073

Fig. 46: Removing Cable Support Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

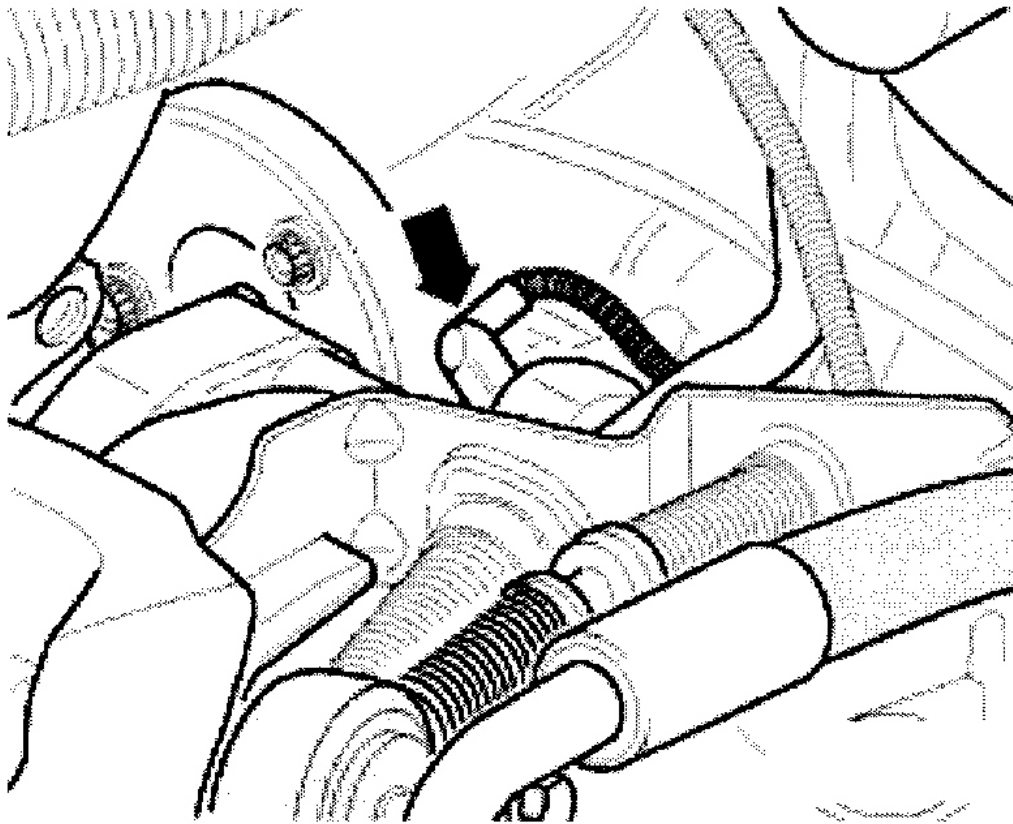
4. Pull lock washer (arrow 1) from gate selector cable relay lever (A). See **Fig. 47** . Remove gear selector cable (B) with transmission selector lever, by removing nut (arrow 2). Remove power steering pipe (arrow 3). If necessary, use puller, such as Kukko 20-10.



G00370074

Fig. 47: Removing Gate & Gear Selector Cables
Courtesy of VOLKSWAGEN UNITED STATES, INC.

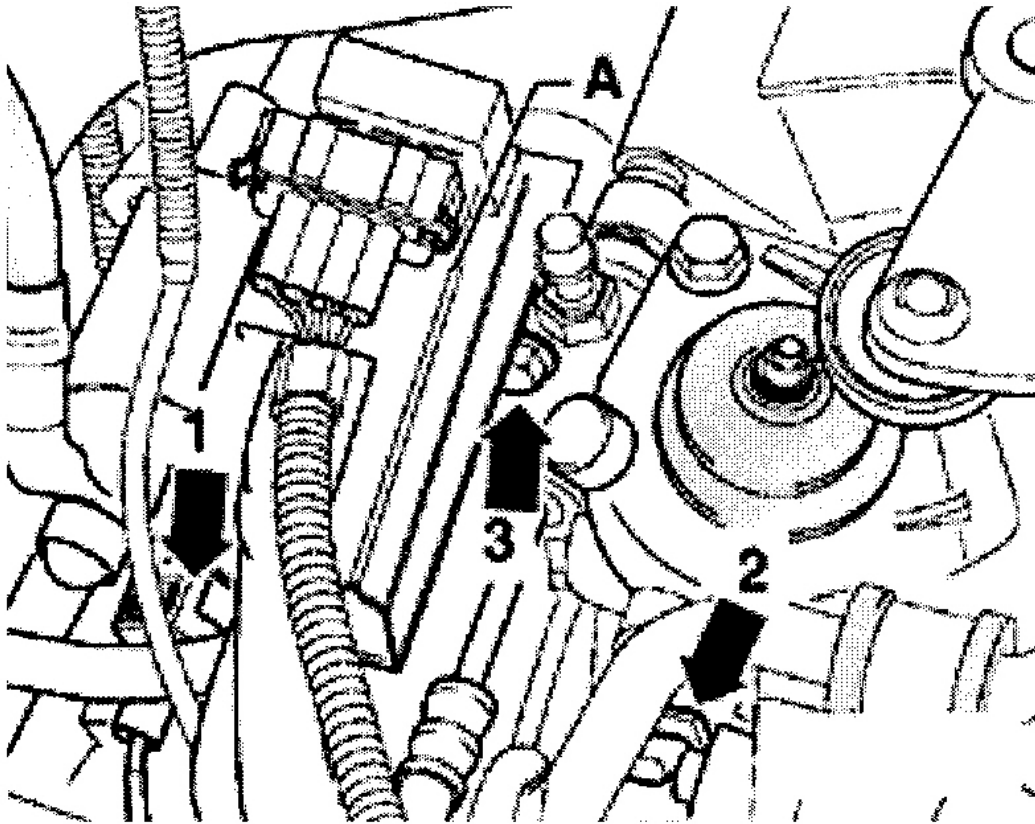
5. Disconnect speedometer speed sensor (arrow) harness connector. See **Fig. 48** .



G00370075

Fig. 48: Locating Speedometer Speed Sensor
Courtesy of VOLKSWAGEN UNITED STATES, INC.

6. Remove wiring (arrow 1) from starter. See **Fig. 49** . Disconnect reverse light harness connector (arrow 2). Remove cable retainer (arrow 3) from starter. Remove upper securing bolt on starter.

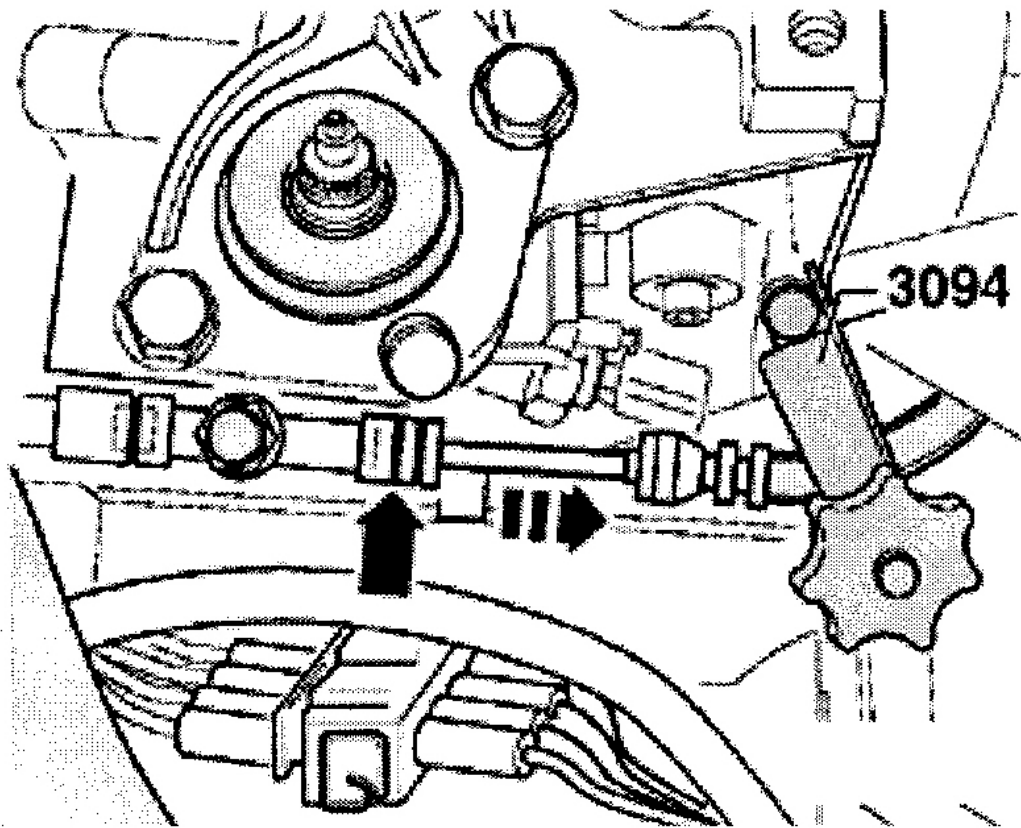


G00370076

Fig. 49: Disconnecting Starter Wiring

Courtesy of VOLKSWAGEN UNITED STATES, INC.

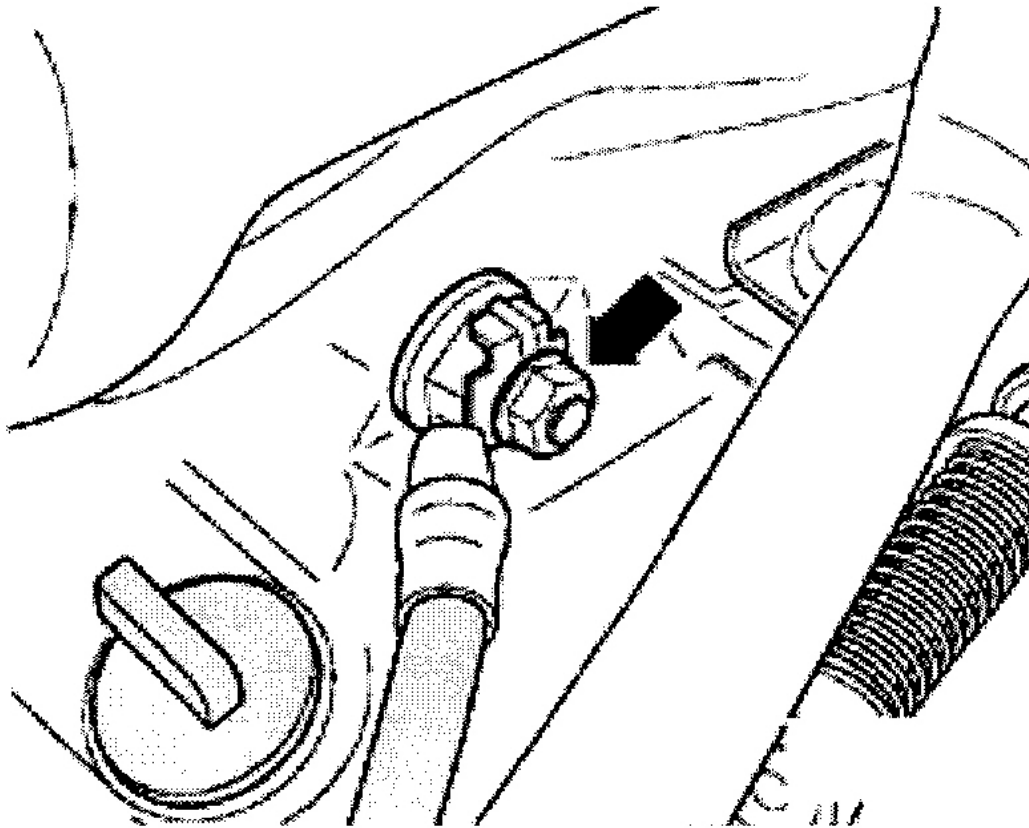
7. Using special clamp (3094), clamp clutch slave cylinder hose. See **Fig. 50** . Pull out clamp (arrow) and line/hose in direction of arrow. DO NOT depress clutch pedal.



G00370077

Fig. 50: Clamping Slave Cylinder Line/Hose
Courtesy of VOLKSWAGEN UNITED STATES, INC.

8. Remove ground strap at engine/transmission upper securing bolt. See **Fig. 51** . Remove engine/transmission upper securing bolts. Remove any hoses and cable connections in area of engine mounting eye. Engine mounting eye will be used for support (10-222A).

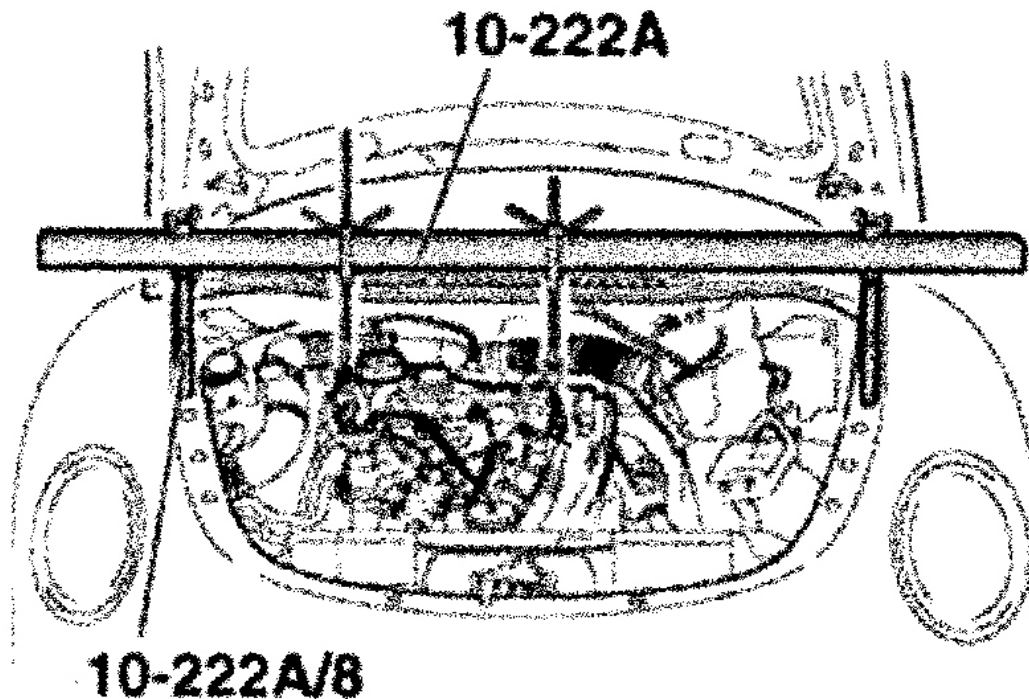


G00370078

Fig. 51: Removing Ground Strap

Courtesy of VOLKSWAGEN UNITED STATES, INC.

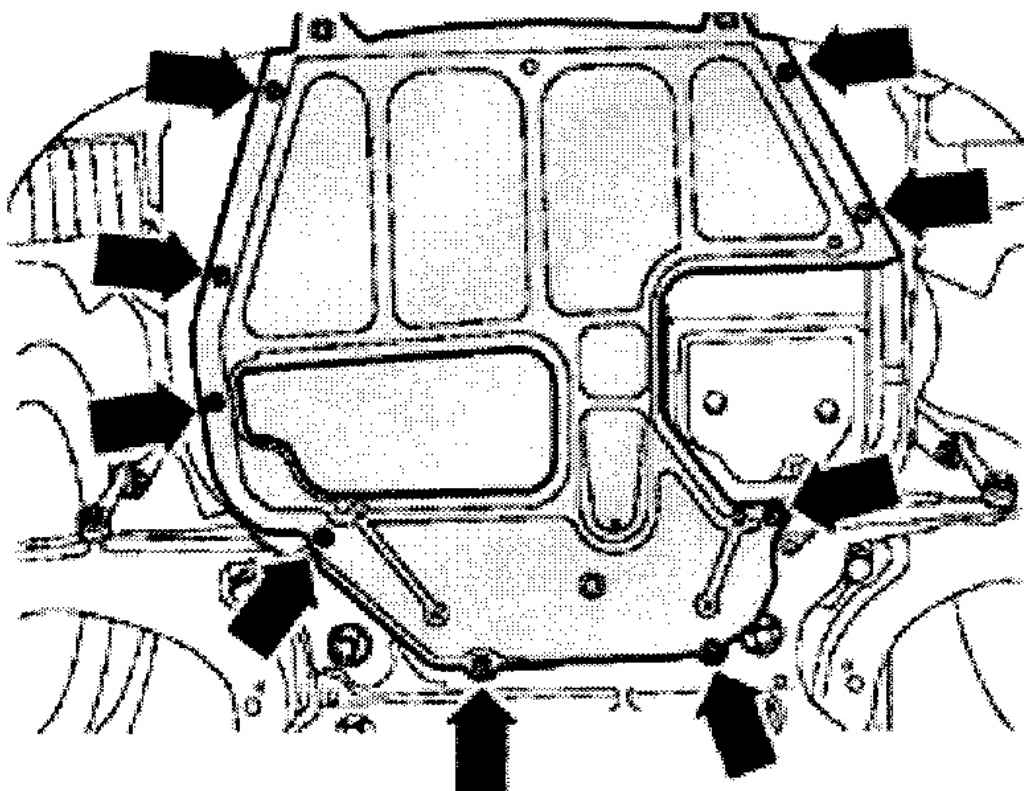
9. Install support bar (10-222A) together with legs (10-222 A/1), special hook (10-222 A/2) and adapter (10-222 A/3). See **Fig. 52** .



G00370110

Fig. 52: Installing Engine Support (10-222A)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

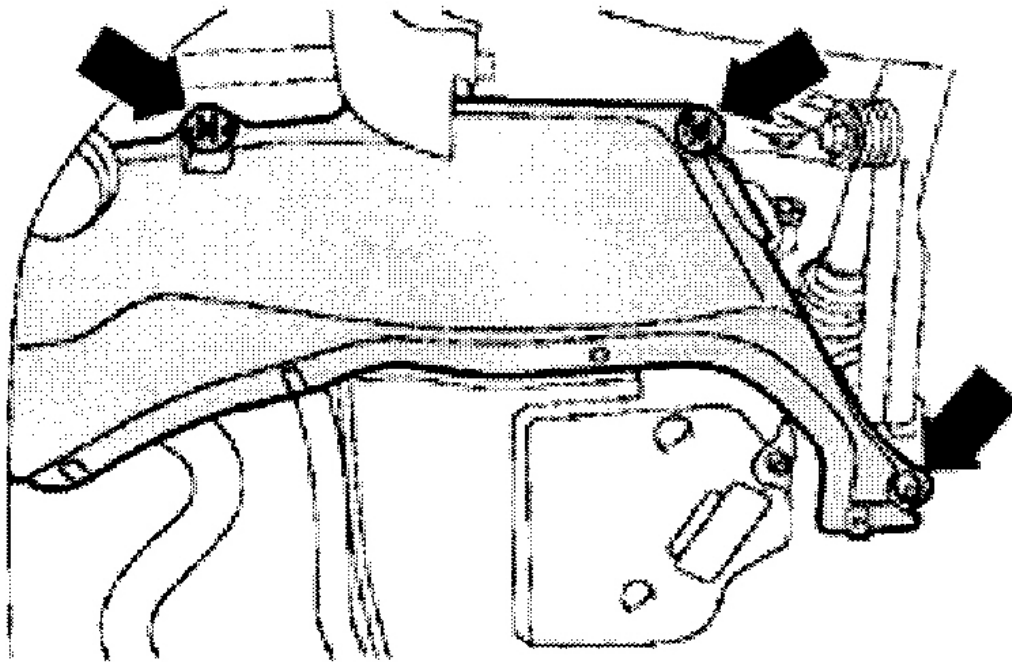
10. Take weight of engine/transmission assembly on spindles. Turn wheels fully to left lock. Raise and support vehicle. Remove noise insulation tray (arrows). See **Fig. 53** .



G00370081

Fig. 53: Identifying Noise Insulation Tray Mounting Points
Courtesy of VOLKSWAGEN UNITED STATES, INC.

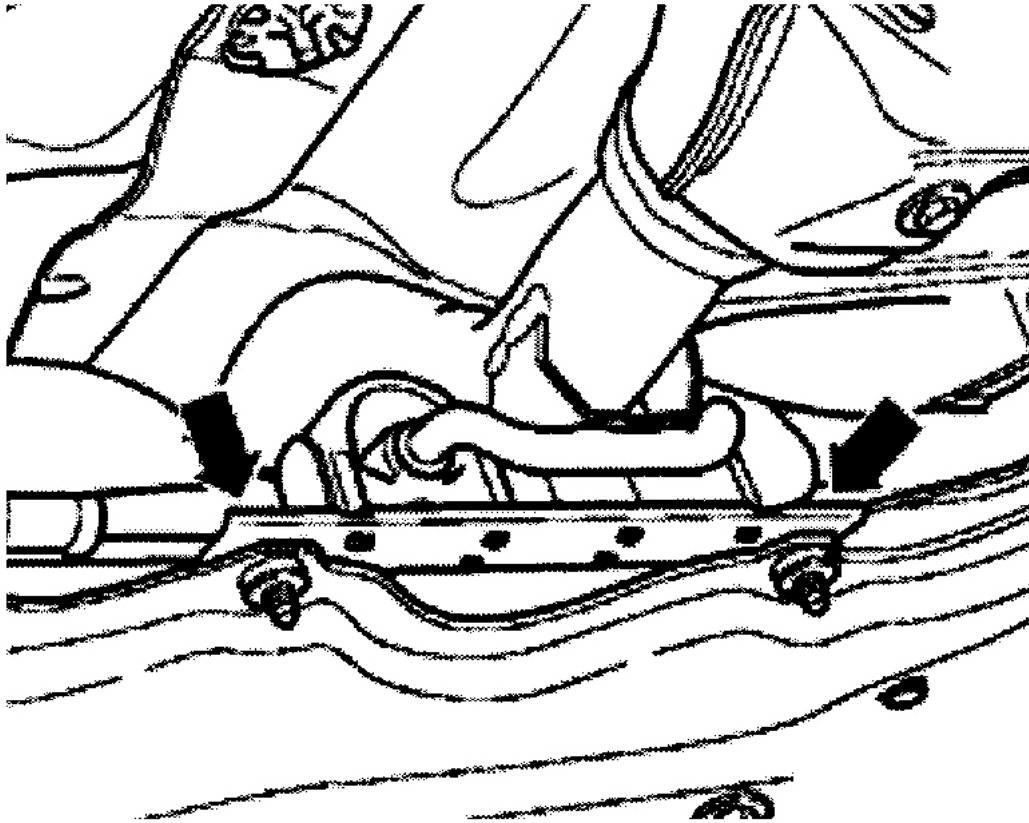
11. Remove left sound insulation (arrows). See **Fig. 54** . Remove right sound insulation.



G00370082

Fig. 54: Identifying Left Sound Insulation Mounting Points
Courtesy of VOLKSWAGEN UNITED STATES, INC.

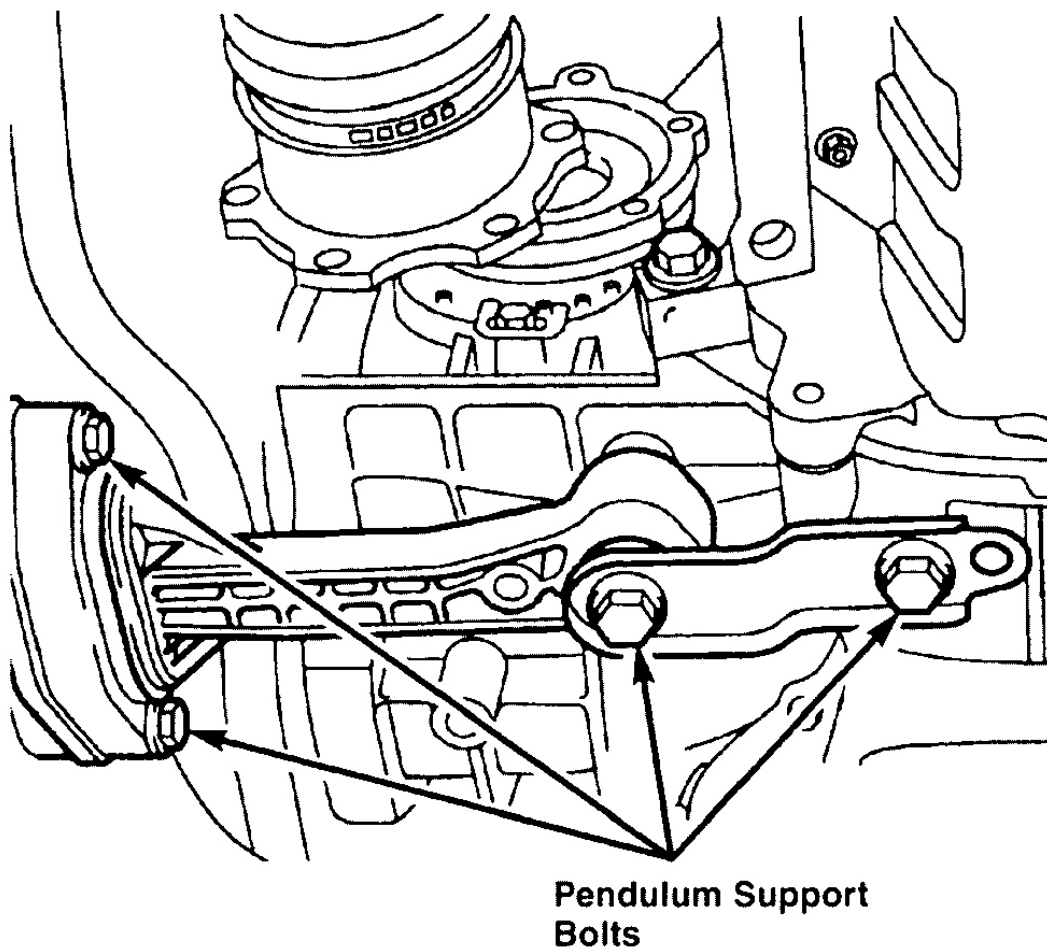
12. Disconnect drive axle shafts from transmission flange. Wire axle shafts up as high as possible. While wiring axle shafts, DO NOT damage body surface protection.
13. Disconnect front exhaust manifold (A). See **Fig. 43** . Remove support (arrows), and unhook support elements. See **Fig. 55** . Secure front exhaust pipe to bodywork, around area of catalytic converter with wire.



G00370112

Fig. 55: Removing Exhaust Supports
Courtesy of VOLKSWAGEN UNITED STATES, INC.

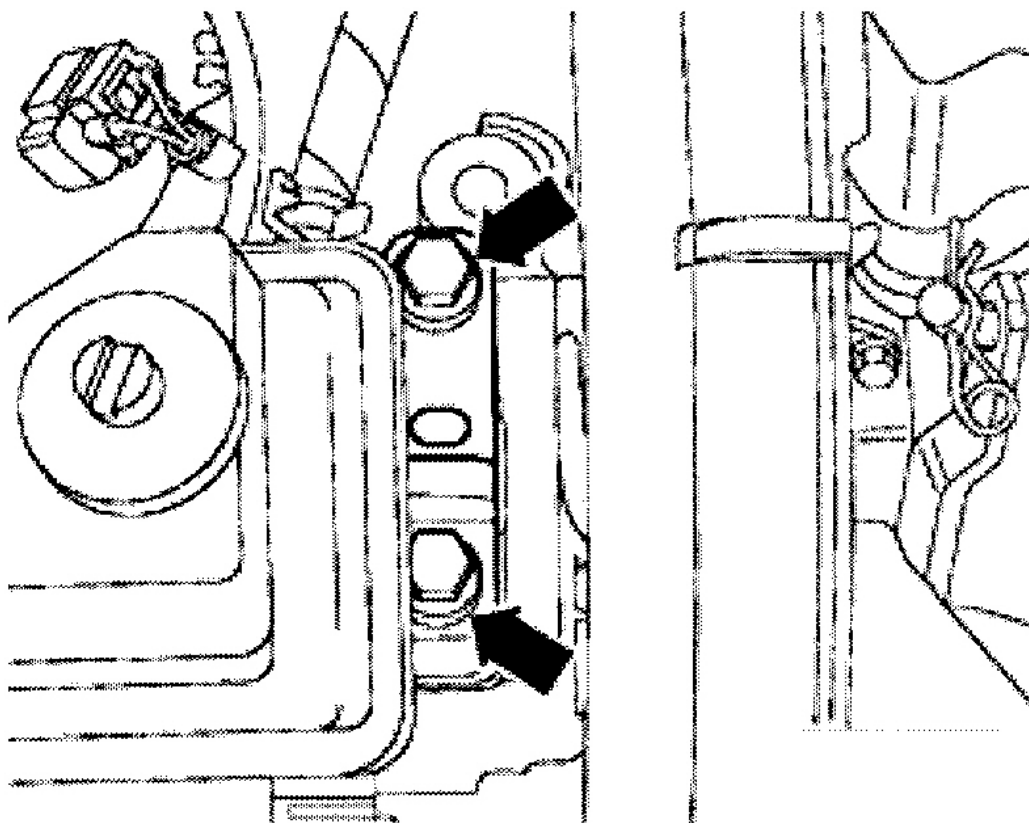
14. Remove pendulum support bolts. See **Fig. 56** . Remove power steering pipe from starter and transmission. Remove starter.



G98D12990

Fig. 56: Removing Pendulum Support
Courtesy of VOLKSWAGEN UNITED STATES, INC.

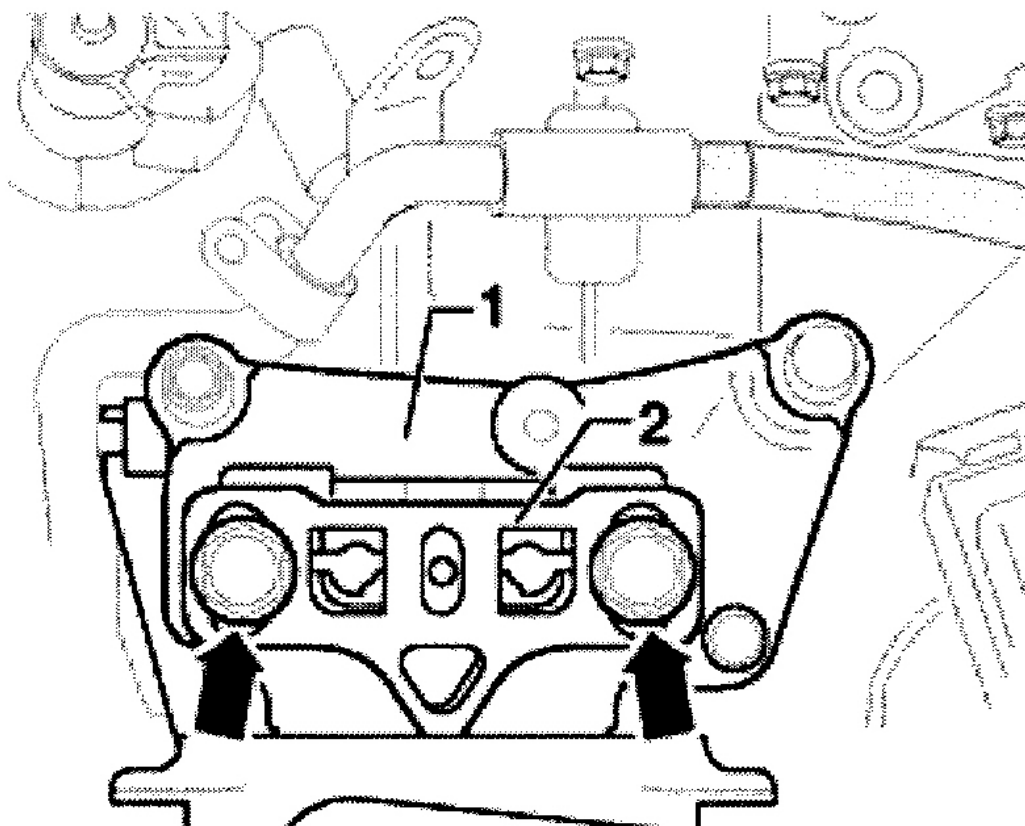
15. Unbolt engine side of right assembly mounting from engine carrier from above (arrows). See **Fig. 57** .



G00370083

Fig. 57: Removing Right Assembly Mounting
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

16. Remove left assembly mounting (2), bolts (arrows) front left mount (1). See **Fig. 58** . Carefully tilt engine and transmission, by lower left-hand spindle approximately 2.36" (60 mm) on support bar (10-222A).



G00370084

Fig. 58: Removing Left Assembly Mounting
Courtesy of VOLKSWAGEN UNITED STATES, INC.

17. Remove left mount (1) from transmission (arrows). See **Fig. 59** .

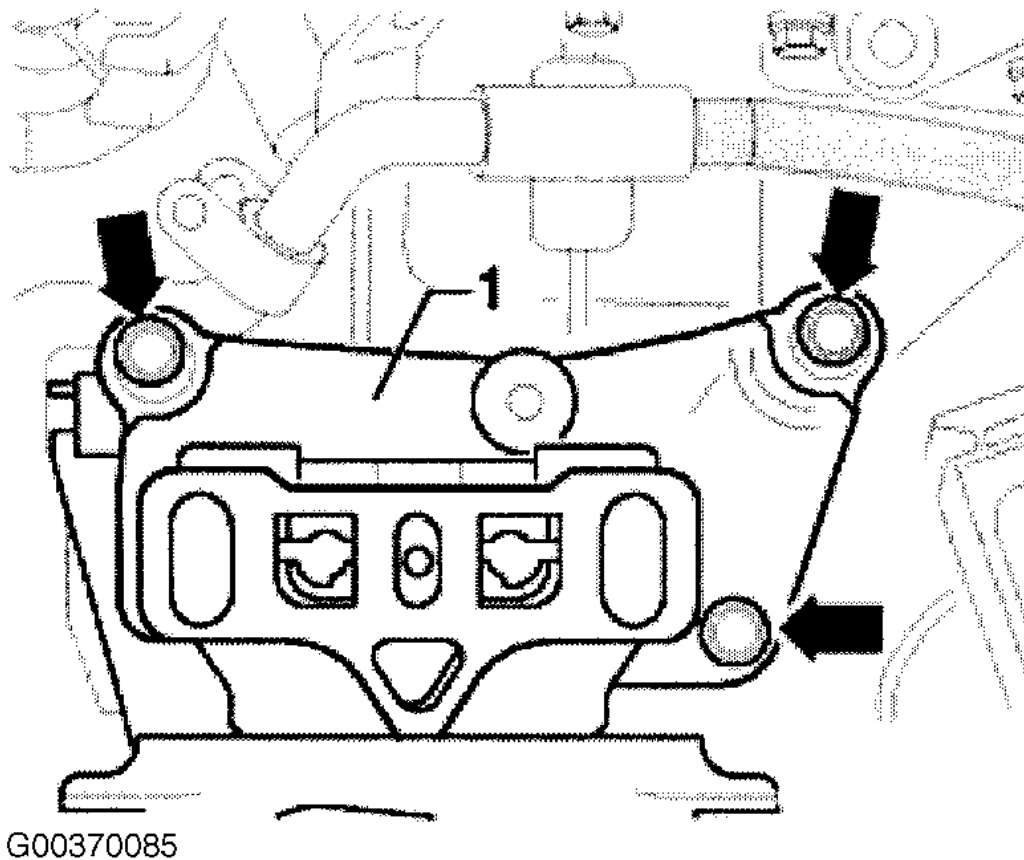
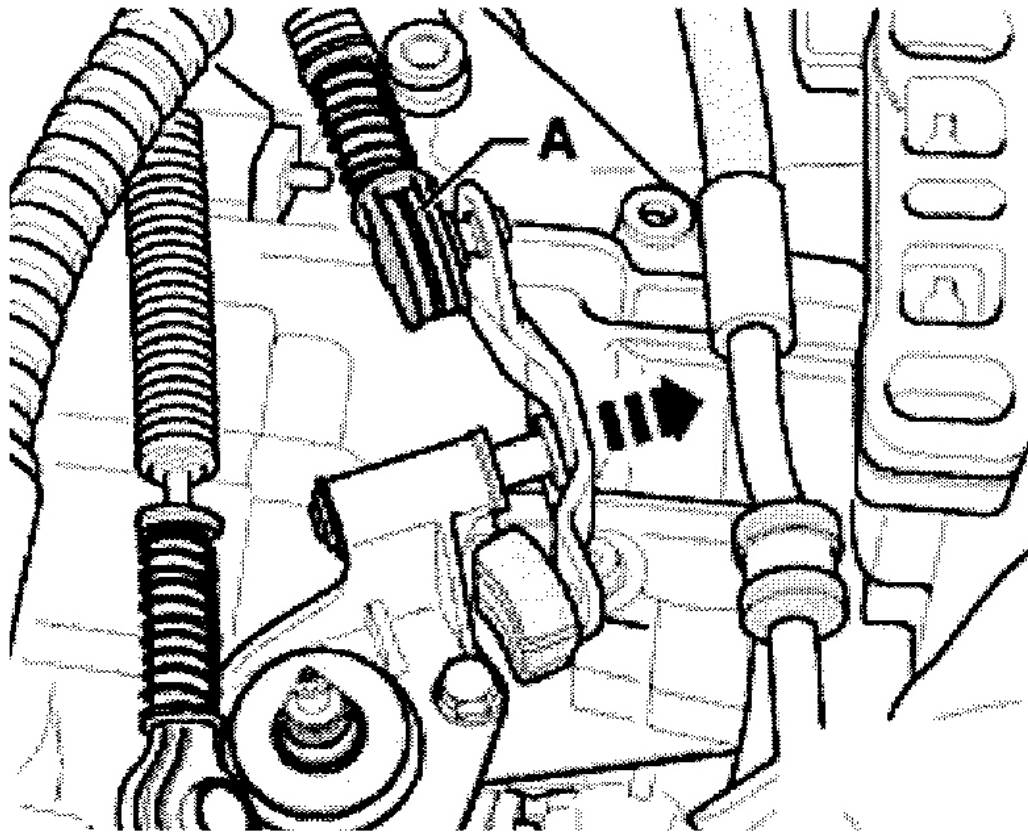


Fig. 59: Removing Left Transmission Mount
Courtesy of VOLKSWAGEN UNITED STATES, INC.

18. Pull off gate selector cable (A) with relay lever, in direction of arrow. See **Fig. 60** . Tie up selector cable with transmission selector lever, and gate selector cable with relay lever. Incline engine/transmission assembly further, by lowering it through left spindle of support bar (10-222A).

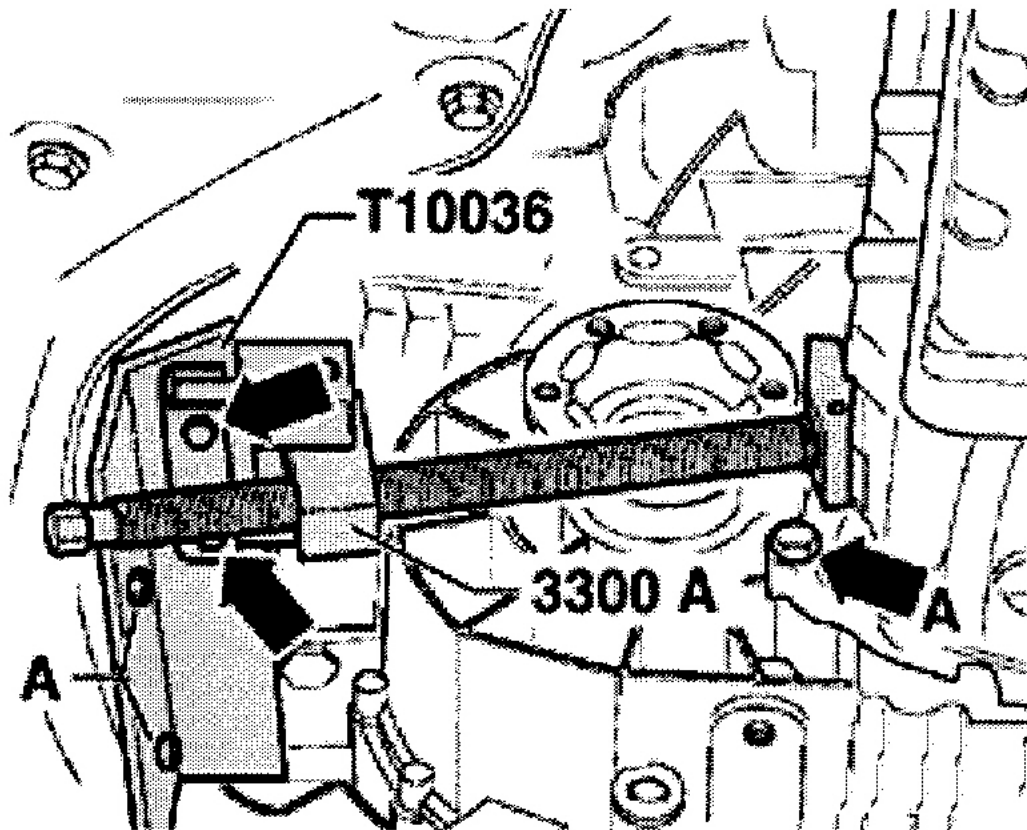


G00370086

Fig. 60: Removing Gate Selector Cable

Courtesy of VOLKSWAGEN UNITED STATES, INC.

19. Bolt support rail (T10036) to both pendulum support securing holes on subframe (bolts A). See **Fig. 61** . Install support (3300 A) so it is almost touching assembly mounting and secure (arrow). Carefully press engine/transmission forward.



G00370087

Fig. 61: Installing Support Rail (T10036)

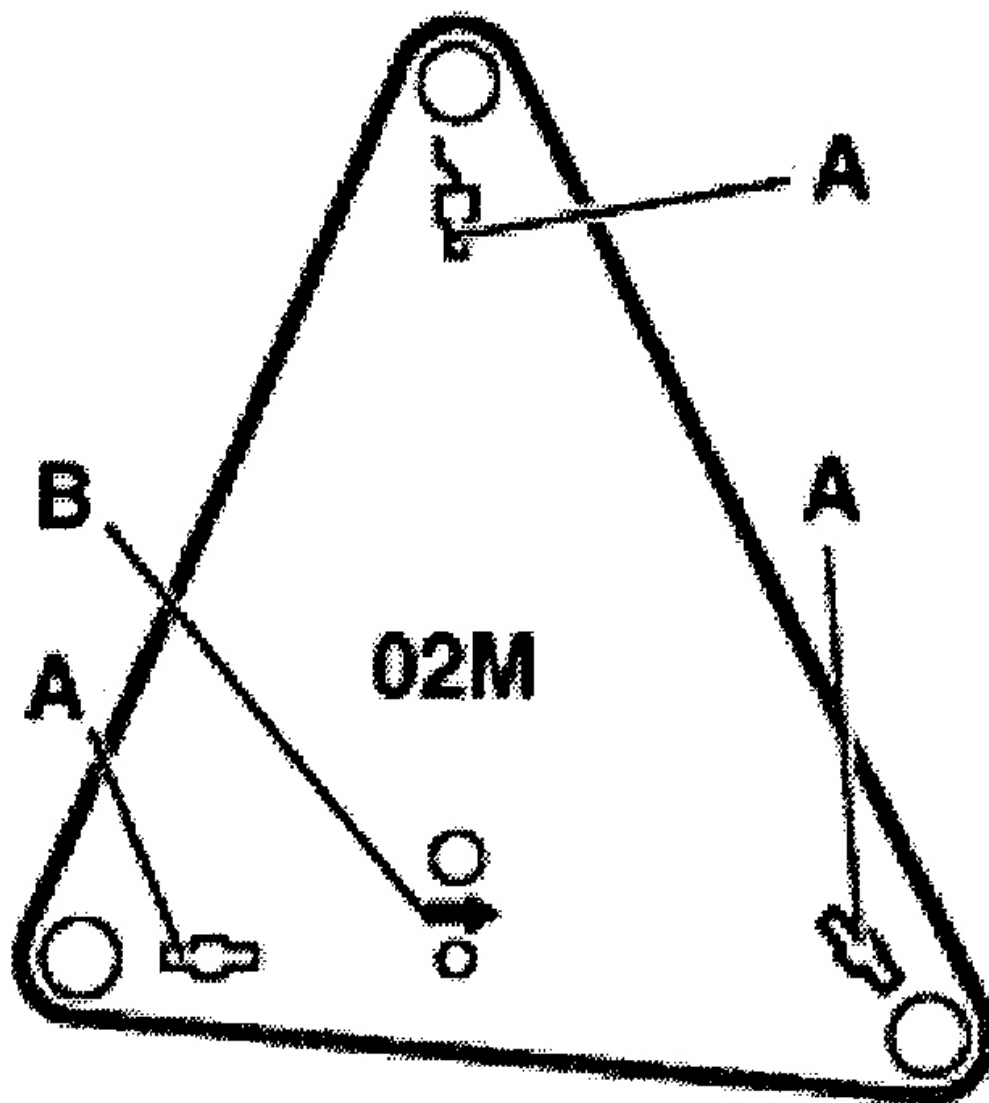
Courtesy of VOLKSWAGEN UNITED STATES, INC.

20.

CAUTION: DO NOT damage any connecting lines and hoses, when moving engine/transmission assembly.

Remove lower rear engine/transmission securing bolts (arrow A). See **Fig. 61** . Remove lower engine/transmission securing bolts.

21. Set up transmission support (3282) with adjustment plate (3282/27) to remove transmission. Align arms of transmission support according to holes in adjustment plate. Bolt support elements (A) on adjustment plate, as shown. See **Fig. 62** . Arrow (B) indicates front of vehicle.

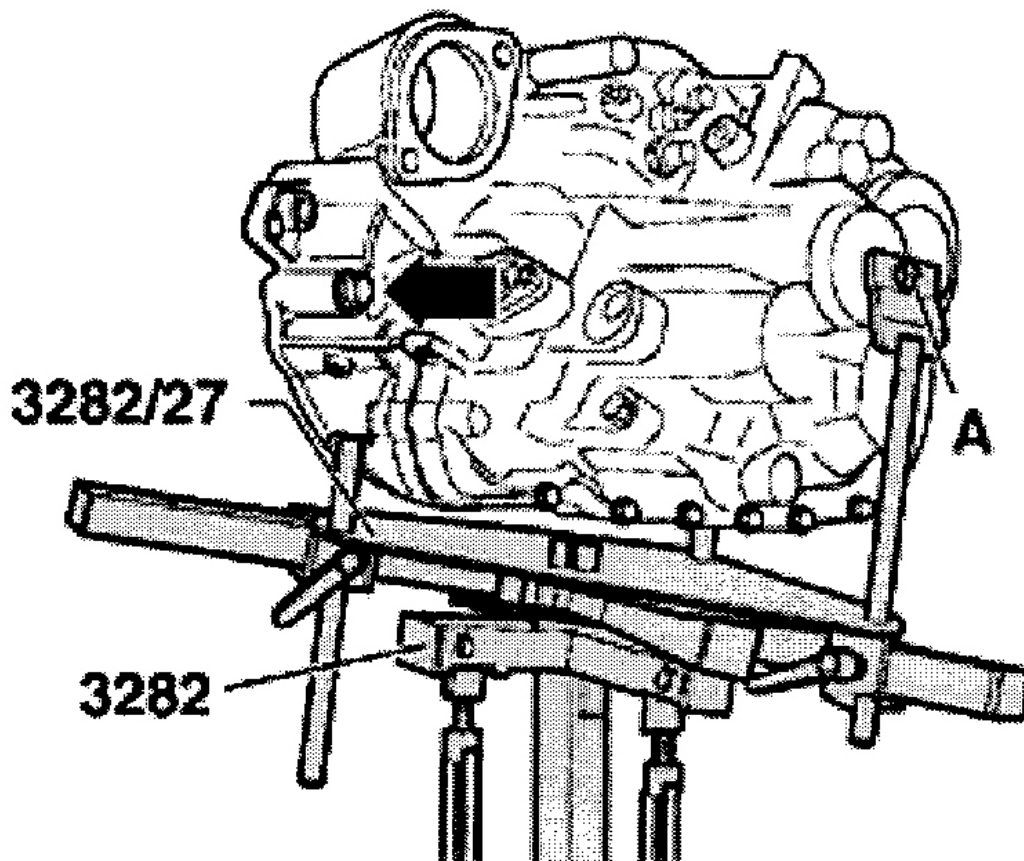


G00370088

Fig. 62: Identifying Adjustment Plate (3282/27)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

22. Place transmission jack under vehicle. Align adjustment plate parallel to transmission. Secure transmission to transmission support (3282) with bolt (A). See **Fig. 63** . Remove engine/transmission connecting bolt (arrow). Press transmission off dowel sleeves, and carefully swing toward subframe. Lower transmission slightly, and incline to left through spindles of transmission support (3282).



G00370089

Fig. 63: Positioning Transmission Support (3282)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

23. Carefully lower transmission, guiding right-hand flange shaft in area of flywheel and left-hand flange shaft, in area of subframe. When lowering transmission, change position of transmission, using transmission support (3282) spindles. DO NOT damage power steering line when lowering transmission.

Installation

1. Apply grease to ball stud and inner surface of release bearing. Clean input shaft splines and lightly grease with G000 100 grease. Ensure clutch disc slides on input shaft splines.
2. Check whether dowel sleeves for aligning engine/transmission are installed in cylinder block. Install if necessary. Ensure that intermediate plate is correctly positioned on engine.
3. Install pressure plate bolts finger tight. Using clutch centering tool (3190A), align clutch disc and pilot bushing holes. Tighten pressure plate bolts to specification using a crosswise pattern. See **TORQUE SPECIFICATIONS**.

4. If flywheel was removed, using flywheel lock (3067) or similar device to hold crankshaft from turning. Tighten flywheel bolts to specification. See **TORQUE SPECIFICATIONS**.
5. Bolt support rail (T10036) to both pendulum support securing holes on subframe (arrows). See **Fig. 61**. Install support (3300 A) so it is almost touching assembly mounting and secure (arrows). Press engine forward carefully. Do NOT damage power steering line.
6. Install transmission to engine. Do NOT damage power steering line. Install lower rear engine/transmission connecting bolt (arrow A). See **Fig. 61**. Install lower engine/transmission securing bolts. Tighten bolts to specification. See **TORQUE SPECIFICATIONS**. Remove pressing device 3300 A (arrows). Remove bolt (A). Remove support rail (T10036).
7. Install gate selector cable (A) with relay lever in direction of arrow. See **Fig. 60**.
8. Install left mount (1) on transmission (arrows). See **Fig. 59**. Align engine/transmission in installation position. Install NEW hex bolts (arrows) for left assembly mounting (2) in mount (1). See **Fig. 58**.
- 9.

WARNING: DO NOT remove support bar (10-222A) until bolts securing left and right assembly mountings have been tightened to torque specification.

Install NEW hex bolts (arrows) for right assembly mounting in engine mounting. See **Fig. 57**.

10. Install pendulum support. See **Fig. 56**. Use NEW bolts for securing. Tighten to specification. See **Fig. 64**.
11. Install drive axle shafts to transmission. Tighten bolts to specification. See **TORQUE SPECIFICATIONS**.
12. Reconnect exhaust system. Install starter and secure with lower bolt. Install retainer for power steering line on starter and on transmission.
13. Install upper engine/transmission securing bolts. Tighten upper engine/transmission securing bolts to specification. See **TORQUE SPECIFICATIONS**.
14. Install ground strap at upper engine/transmission securing bolt. See **Fig. 51**. Attach connector to speedometer sensor (arrow). See **Fig. 48**.
15. Install slave cylinder line/hose in clamp. See **Fig. 50**. Remove special tool (3094). Install upper securing bolt on starter.
16. Install cable retainer (A) on starter (arrow 3). See **Fig. 49**. Attach connectors for starter (arrow 1) and back-up light (arrow 2).
17. Install cable support bracket on transmission (arrows). See **Fig. 46**. Tighten bolts to specification. See **TORQUE SPECIFICATIONS**.
18. Install gear selector cable (B) with transmission selector lever (arrow 2). See **Fig. 47**. Tighten NEW self-locking hex nut (arrow 2) to 18 ft. lbs. (25 N.m). Secure gate selector cable (A) with relay lever using lock washer (arrow 1). Install power steering line (arrow 3).
19. Install battery and battery carrier. Install complete air cleaner housing by tightening bolts (4 and 5). See **Fig. 17**. Install intake hose (1). Attach connector (2) and hose (3) to Mass Air Flow sensor.
20. Install insulation tray below engine/transmission, if so equipped. Lower vehicle. Install engine cover. Adjust gear selector mechanism. See **SELECTOR MECHANISM** under ADJUSTMENTS.
21. Bleed clutch system, if necessary. See **BLEEDING**. Check transmission oil level, if necessary.

OVERHAUL

CLUTCH MASTER CYLINDER

Information not available from manufacturer.

CLUTCH SLAVE CYLINDER

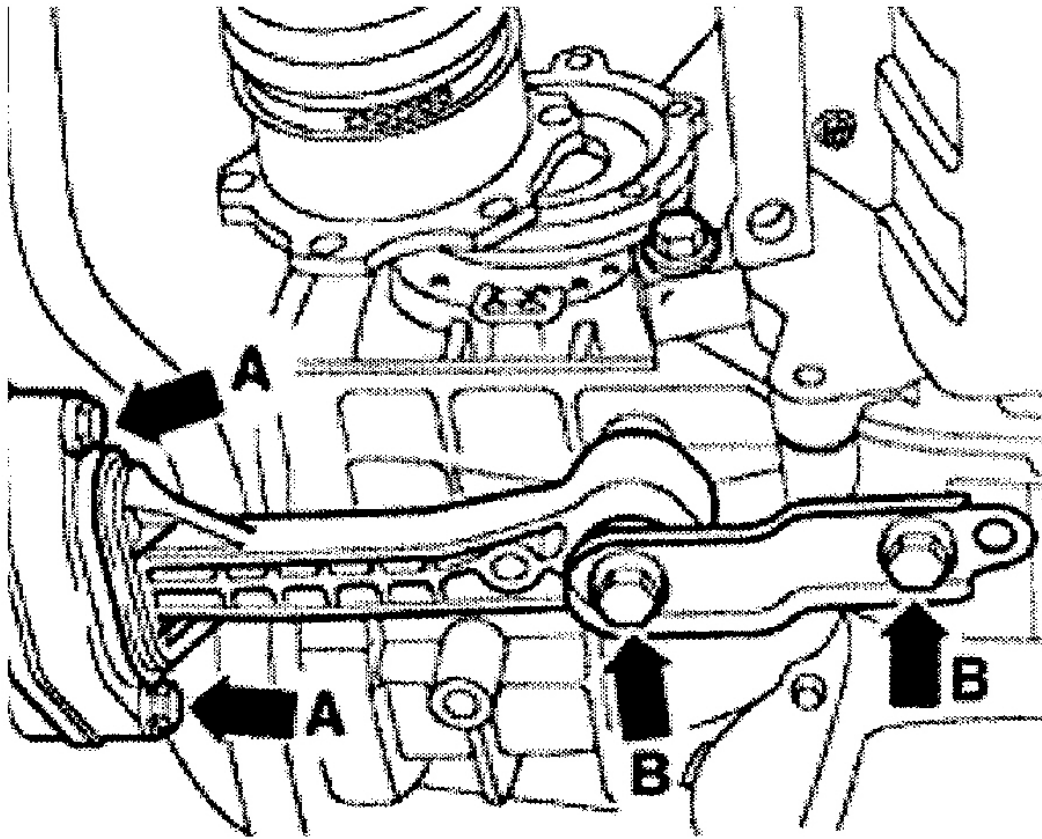
Information not available from manufacturer.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Axle Shaft-To-Transmission Flange Bolt	
M8	30 (40)
M10	52 (70)
Cable Support Bracket-To-Transmission Bolt	18 (25)
Clutch Pedal Mounting Plate Nut	(1) 18 (25)
Clutch Master Cylinder Nut	(1) 18 (25)
Cross Support-To-Body Bolt	18 (25)
Exhaust System Nut	22 (30)
Flywheel-To-Crankshaft Bolt (1)	
Step 1	44 (60)
Step 2	Additional 90° Turn
Gearshift Selector Assembly	
Gear Selector Cable Mounting Bolt	18 (25)
Gear Selector Lever Self-Locking Nut	(1) 18 (25)
Shift Housing-To-Body	18 (25)
Support Bracket Bolt	18 (25)
Selector Housing Nut	18 (25)
Selector Lever-To-Transmission	15 (20)
Pendulum Support Bolt	(1) , (2)
Pressure Plate Bolt (1) , (3)	
1-Piece Flywheel	16 (22)
2-Piece Flywheel	15 (20)
Starter Bolt	48 (65)
Transmission-To-Body Bolt	(5) 74 (100)
Transmission Mount-To-Transmission (1) , (6)	

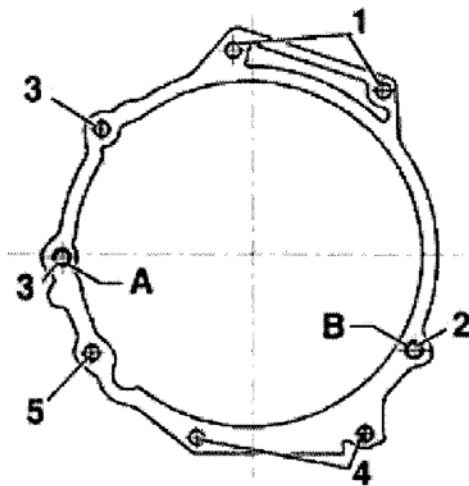
Step 1	37 (50)
Step 2	Additional 90° Turn
Transmission-To-Engine Bolt	(4)
Transmission Selector Lever Nut	⁽¹⁾ 15 (20)
Wheel Lug Bolt	89 (120)
INCH Lbs. (N.m)	
Slave Cylinder/Release Bearing Bolt	106 (12)
(1) Always replace with NEW fastener. Always replace self-locking nuts. (2) See Fig. 64 . (3) Loosen or tighten bolts gradually, in a crosswise pattern. (4) See Fig. 65 . (5) See Fig. 66 . (6) See Fig. 67 .	



Bolts -A- 20 Nm + 90°
Bolts -B- 40 Nm + 90°

G00370056

Fig. 64: Identifying Pendulum Support Bolt Torque Specification
Courtesy of VOLKSWAGEN UNITED STATES, INC.

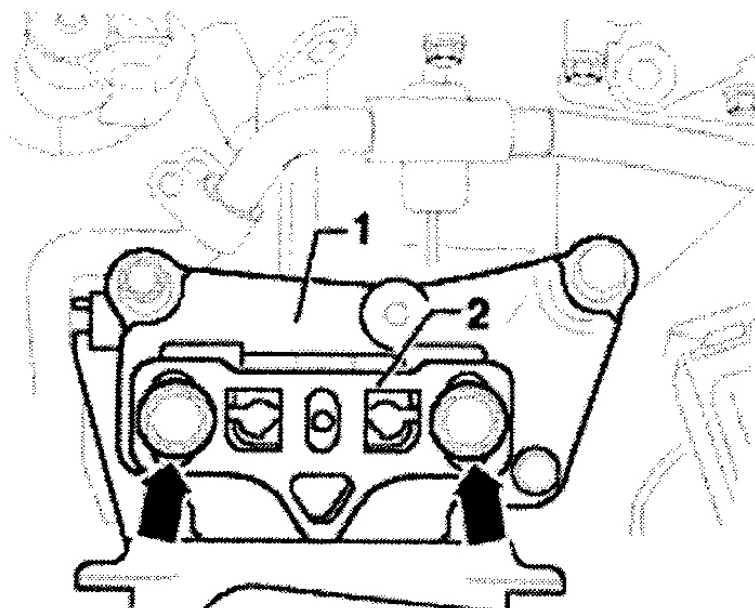


Item	Bolt	Qty.	Nm
1	M 12 x 55	2	80
2	M 12 x 70	1	80
3 ¹⁾	M 12 x 165	2	80
4	M 10 x 50	2	40
5	M 10 x 105	1	60

1) Also starter to transmission
 Always replace bolts
 Items A + B = Dowel sleeves

G00370090

Fig. 65: Identifying Engine/Transmission Bolt Torque Specification
 Courtesy of VOLKSWAGEN UNITED STATES, INC.



Transmission to body

Bolts -arrows- 100 Nm

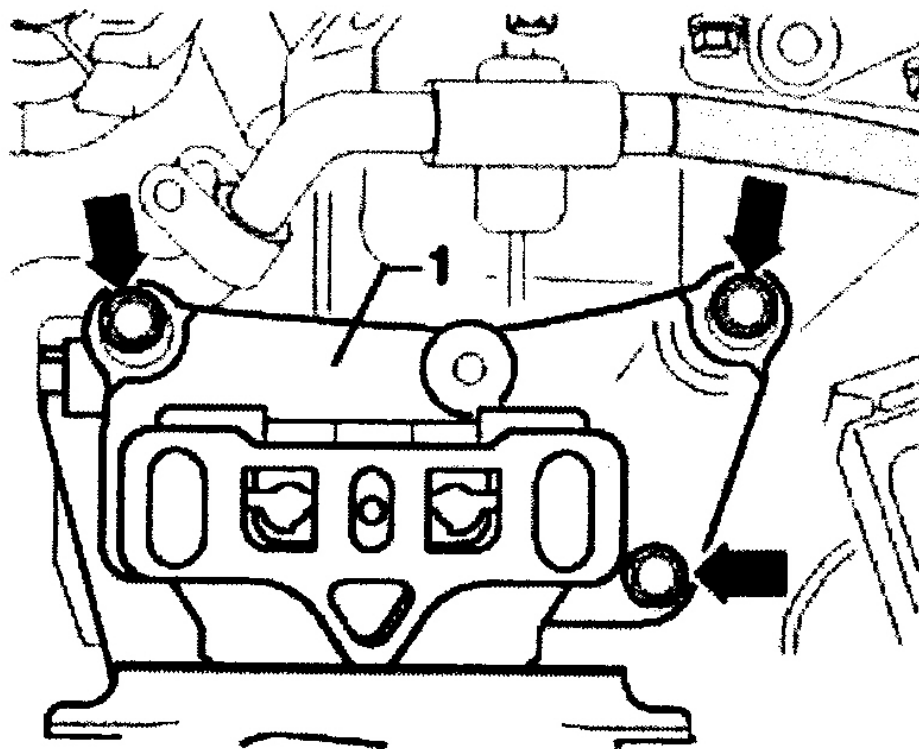
Note:

Install engine/transmission mountings stress-free.

G00374957

Fig. 66: Identifying Transmission-To-Body Torque Specification

Courtesy of VOLKSWAGEN UNITED STATES, INC.



Transmission mount -1- to transmission
Bolts -arrows- 50 Nm + 90°
- Replace bolts

G00374956

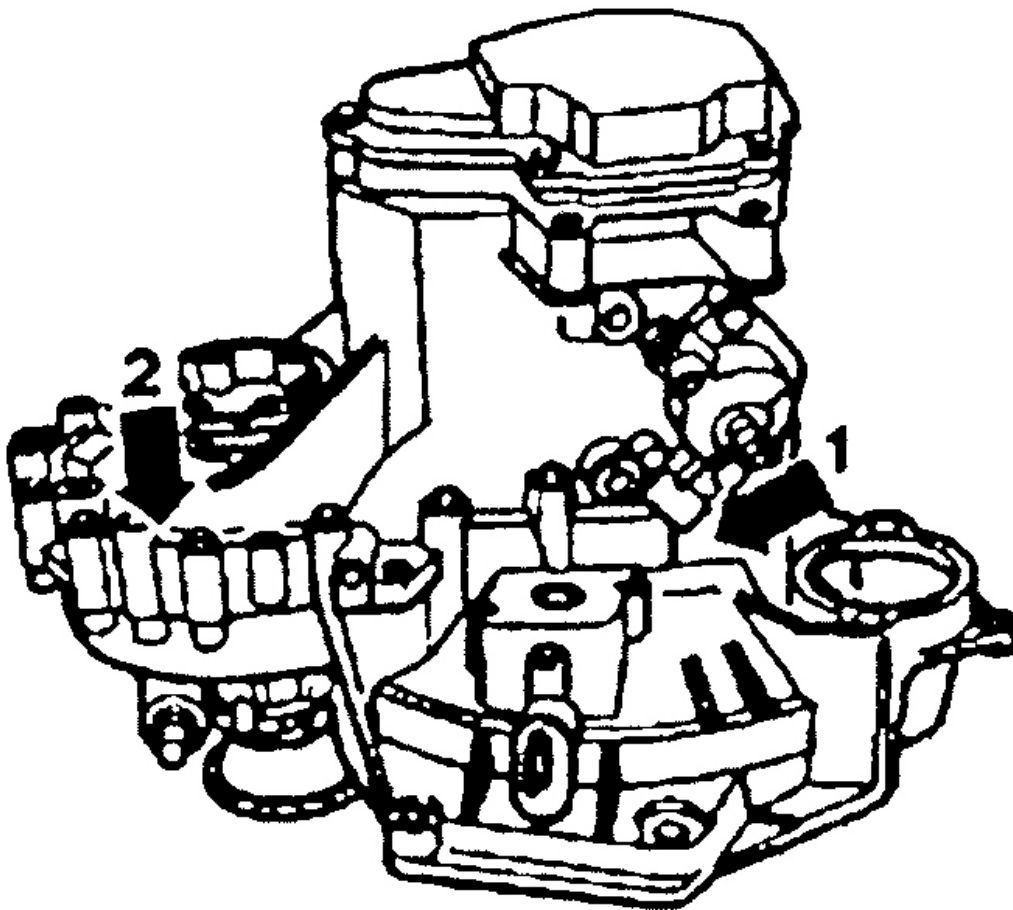
Fig. 67: Identifying Transmission Mount-To-Transmission Torque Specification
Courtesy of VOLKSWAGEN UNITED STATES, INC.

1998-2004 CLUTCHES

New Beetle (5-Speed, 02J)

IDENTIFICATION

On 02J transmission identification tag is located on transmission, identifying code letters and date of manufacture (1), and transmission model (2). See **Fig. 1** .



G00204248

Fig. 1: Locating Identification Tag

Courtesy of VOLKSWAGEN UNITED STATES, INC.

DESCRIPTION & OPERATION

Clutch is a single-disc type, using a diaphragm spring to engage pressure plate. Clutch is hydraulically controlled by master cylinder, slave cylinder, release lever and pre-lubricated release bearing. Clutch master cylinder is supplied fluid from brake master cylinder fluid reservoir. On some models, a dual mass flywheel is used. Note changes in torque specifications for pressure plate.

BLEEDING

NOTE: Fill brake master cylinder reservoir with DOT 4 brake fluid.

Connect brake filler/bleeder unit (VAG 5234), or equivalent. Attach hose (A) to bleeder fitting located on clutch slave cylinder (B), next to hydraulic line. See **Fig. 2** . Open bleed valve. Turn bleed unit on. Depress clutch pedal several times, after completion of bleeding process.

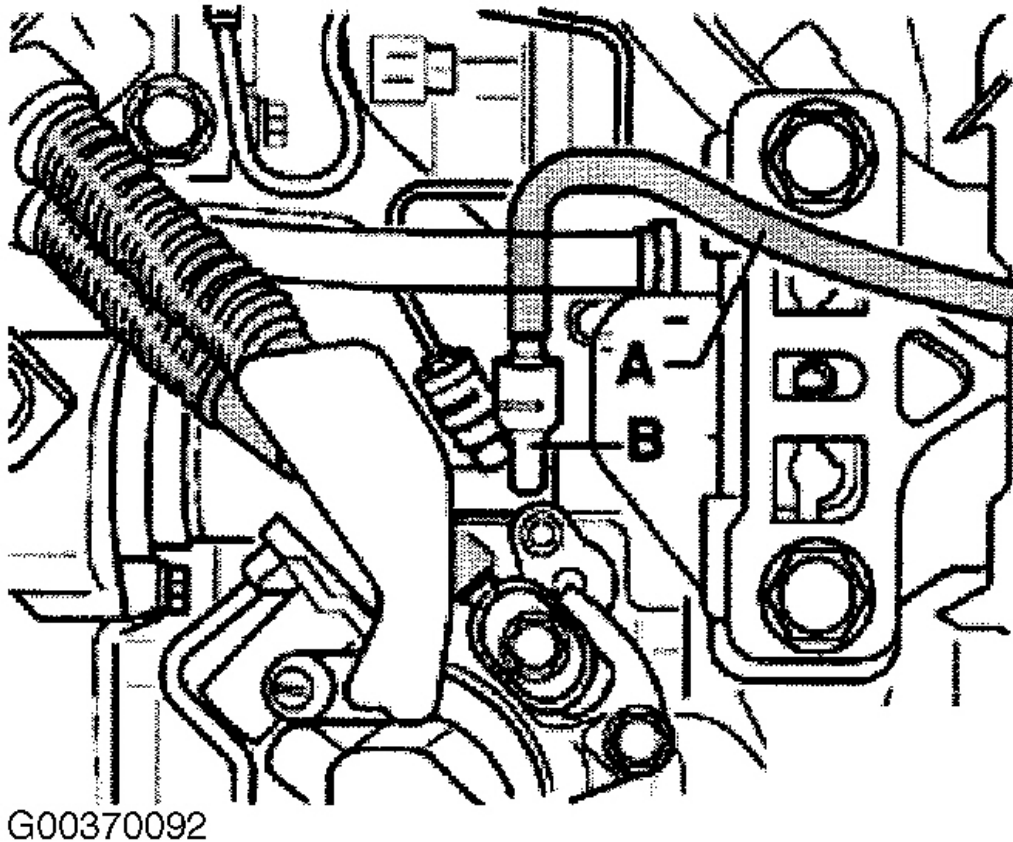


Fig. 2: Connecting Bleed Hose To Bleeder Valve
Courtesy of VOLKSWAGEN UNITED STATES, INC.

ADJUSTMENTS

BRAKE LIGHT SWITCH

NOTE: Two different styles of brake light switch were used in production.

NOTE: On diesel and gasoline models equipped with cruise control, brake switch and brake pedal switch are integrated.

For servicing purposes, they will be referred to as "old style" and "new style". It is important to identify which style of switch is installed, prior to servicing, as each requires specific removal and installation (replacement) procedures. See **Fig. 3**.

"Old style" switch is identified by a large (approximately 10 mm) plunger tip button, and a square plunger shaft. "New style" switch is identified by a small (approximately 4 mm) plunger tip without a button, and round plunger shaft. "Old style" switches can be removed and reinstalled/adjusted. "New style" switch must NOT be reused after removal. Always replace. Should a brake light switch require replacement, only a specific "new style" switch is available (supersedes all previous part number versions). This switch requires critical procedures be followed, prior to and during installation.

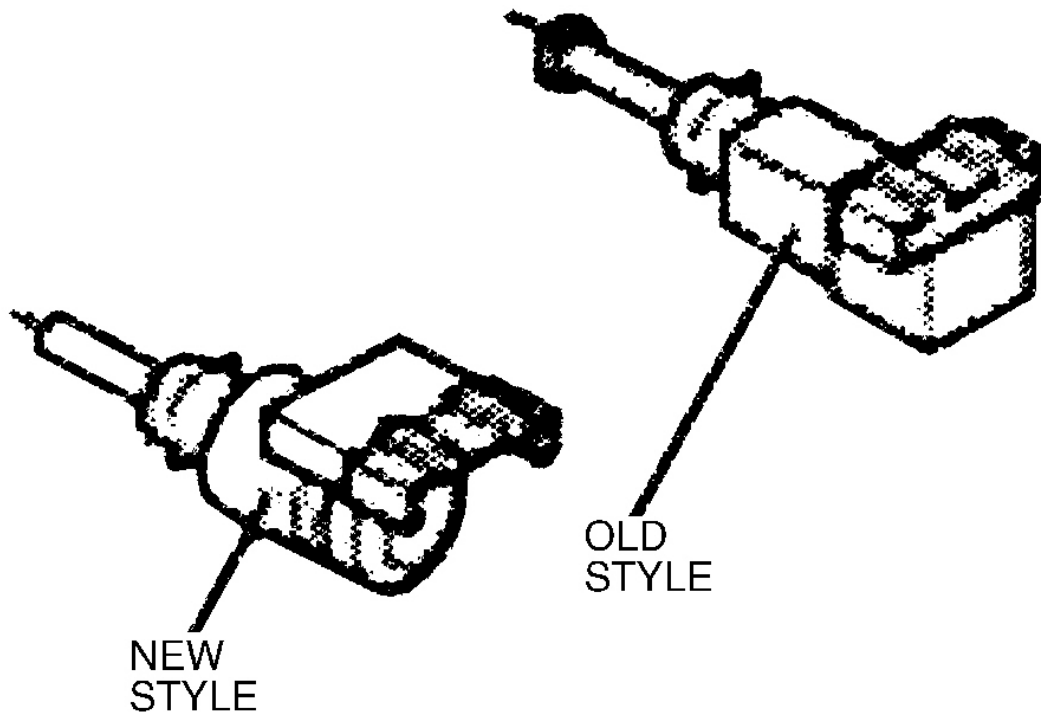
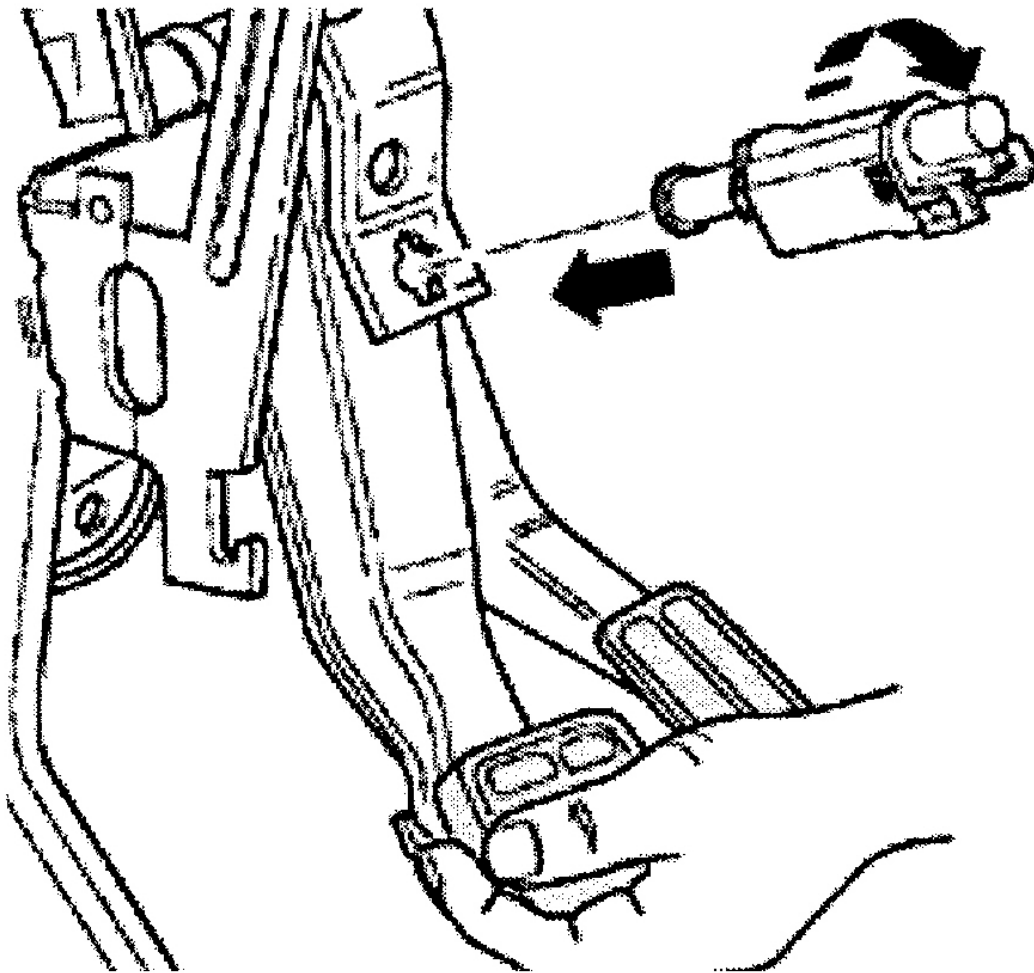


Fig. 3: Identifying "New Style" & "Old Style" Brake Switches
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Brake Light Switch (Old Style)

NOTE: **The following applies only to an existing, functional "old style" switch that is removed, reinstalled/adjusted.**

1. Remove driver's side lower instrument panel cover. Disconnect brake light switch harness connector. Turn switch counterclockwise 90 degrees. Pull switch out from retainer mounting hole. See **Fig. 4** .
2. Pull plunger out completely. Depress and hold brake pedal in down position. Note orientation of retainer tabs on switch, and carefully insert switch into retainer mounting hole. Secure switch, by turning clockwise 90 degrees. Slowly release brake pedal to stop. Connect brake light switch harness connector. Check function of brake light switch.



G00370020

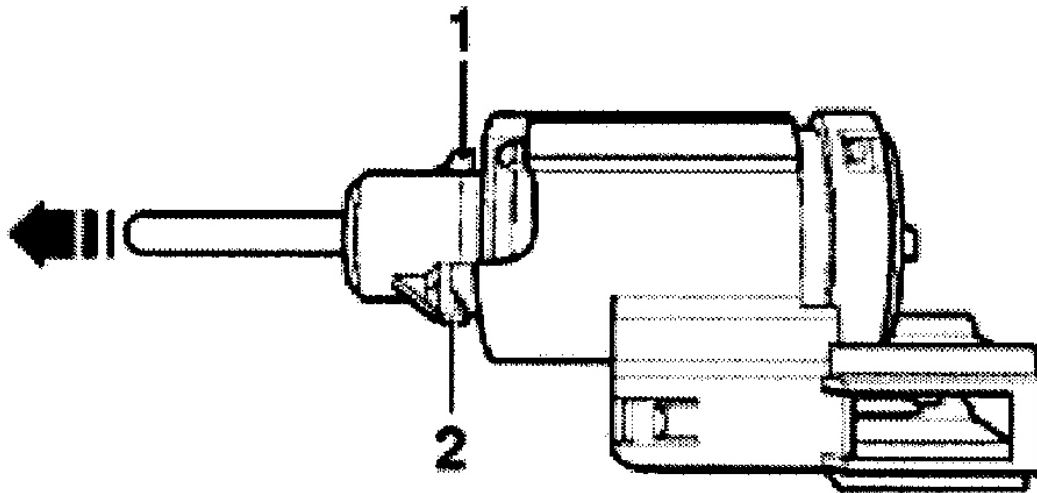
Fig. 4: Removing Brake Light Switch (Old Style)
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Brake Light Switch (New Style)

CAUTION: "New style" switches have an internal switch mechanism that will be damaged if not installed and adjusted accordingly. DO NOT depress switch plunger or otherwise rotate retaining collar of switch prior to installation. Brake pedal must be held in Up position (not depressed) during switch installation.

1. Remove driver's side lower instrument panel cover. Disconnect brake light switch harness connector. Turn switch counterclockwise 45 degrees. Pull switch out from retainer mounting hole. Pull plunger completely out (arrow). See **Fig. 5**.

2. Hold brake pedal in Up position (against stop). Note orientation of retainer tabs (1 and 2) on switch. Carefully insert switch into retainer mounting hold. Push switch in and seat fully into opening (pressing plunger against brake pedal to adjust). Once seated, secure switch by turning clockwise 45 degrees.



G00370021

Fig. 5: Adjusting Brake Light Switch (New Style)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

CLUTCH

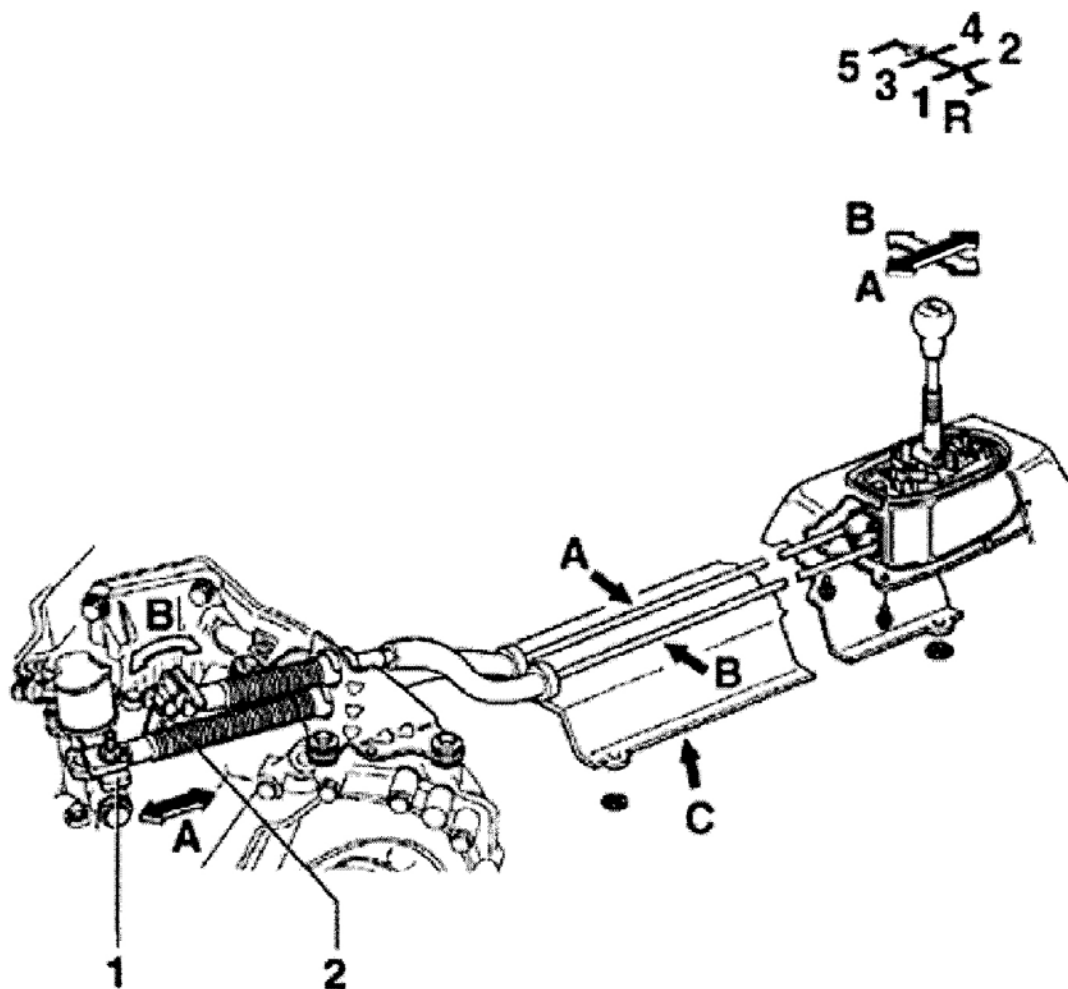
NOTE: Hydraulic clutch systems are automatically adjusted and require no manual adjustment.

SELECTOR MECHANISM

Selector Mechanism (Vehicles Built Up To May 1999)

NOTE: To ensure correct gear selector adjustment, moving parts of selector mechanism and transmission elements must be in proper condition. Selector mechanism must move freely. See **Fig. 6** . Transmission, clutch and clutch mechanism must also be in proper condition. Transmission is in Neutral position.

1. Carefully pry cover off center console (arrows). See **Fig. 7** . Pull cover to rear off center console. Destroy clip (arrow) and pull gear shift knob off with cover. See **Fig. 8** . Remove rubber cover, if equipped.



A - Gear change cable

B - Gate selector cable

C - Heat shield

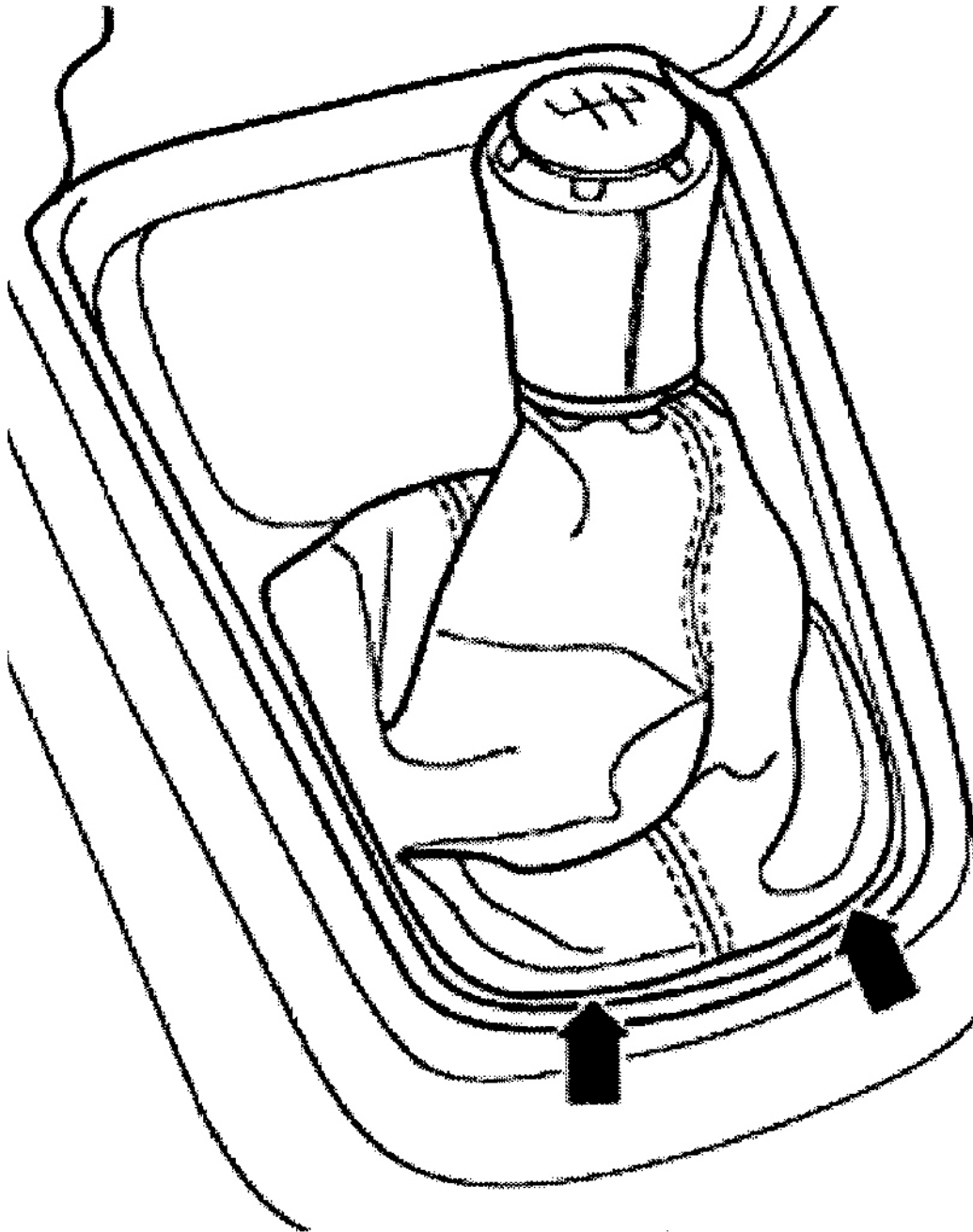
Arrow -A- Gear selection movement

Arrow -B- Gate selection movement

1 - Gear selector lever

2 - Relay lever with actuating arm/gate selector cable

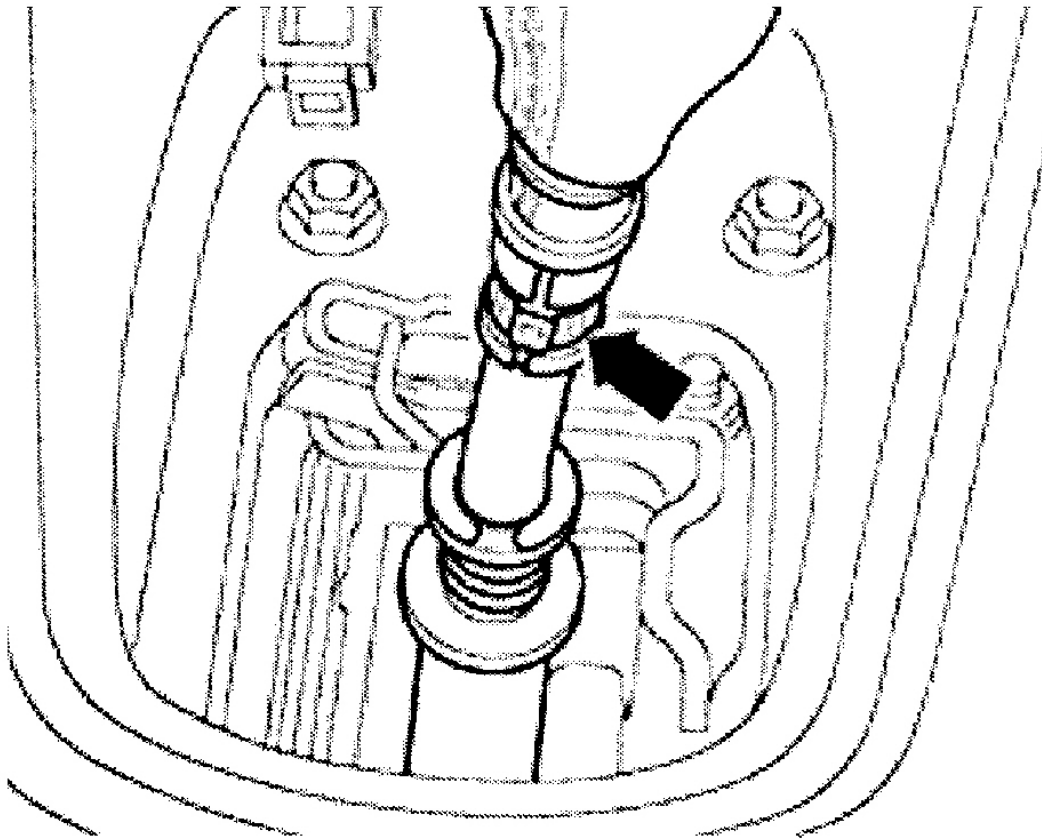
Fig. 6: Identifying Gear Selector Mechanism Components (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.



G00370004

Fig. 7: Removing Center Console Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

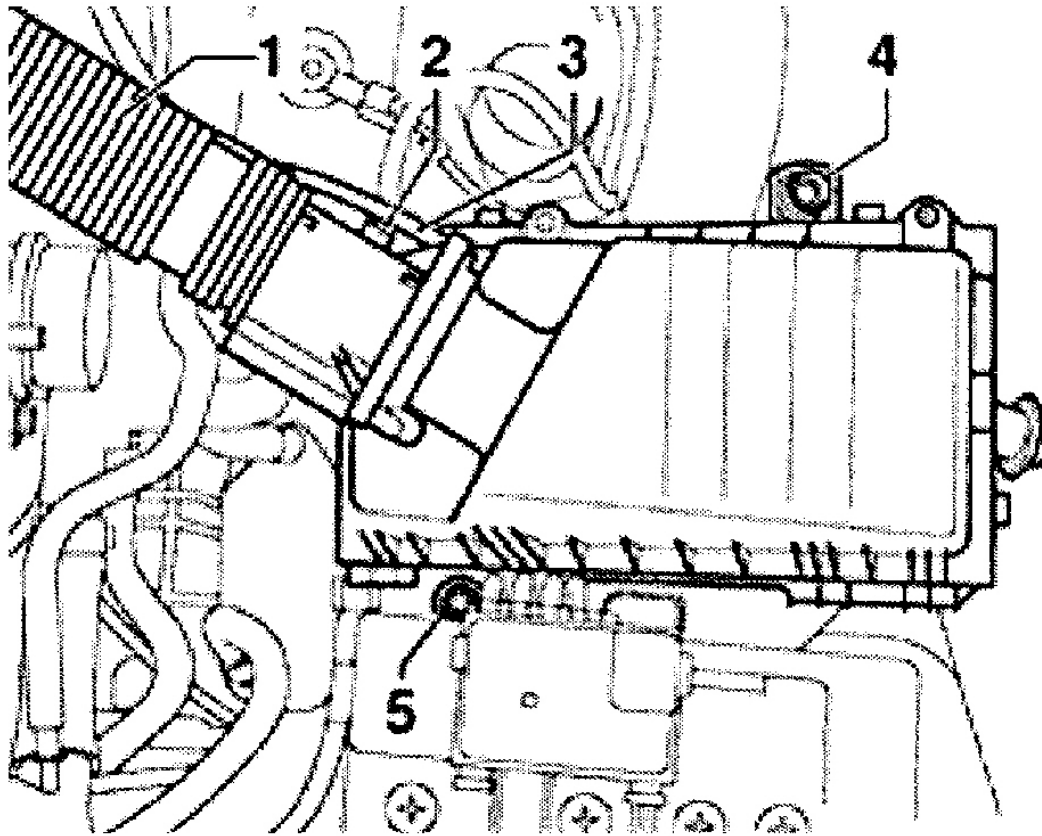


G00370005

Fig. 8: Locating Gear Shift Clip (Vehicles Built Up To May 1999)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

2. Remove intake hose (1), connector (2) and hose (3) from mass air flow sensor. See **Fig. 9** . Remove bolts (4 and 5) securing air cleaner housing. Remove complete air cleaner housing.

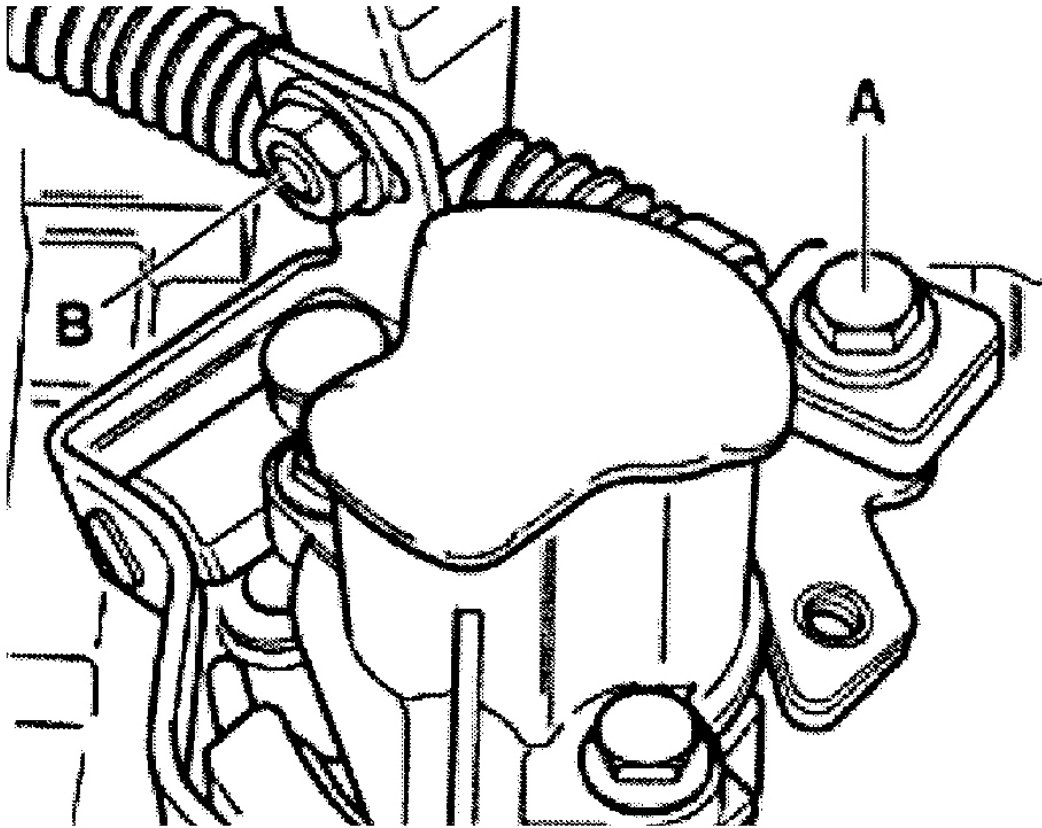


G00370006

Fig. 9: Removing Air Cleaner Housing

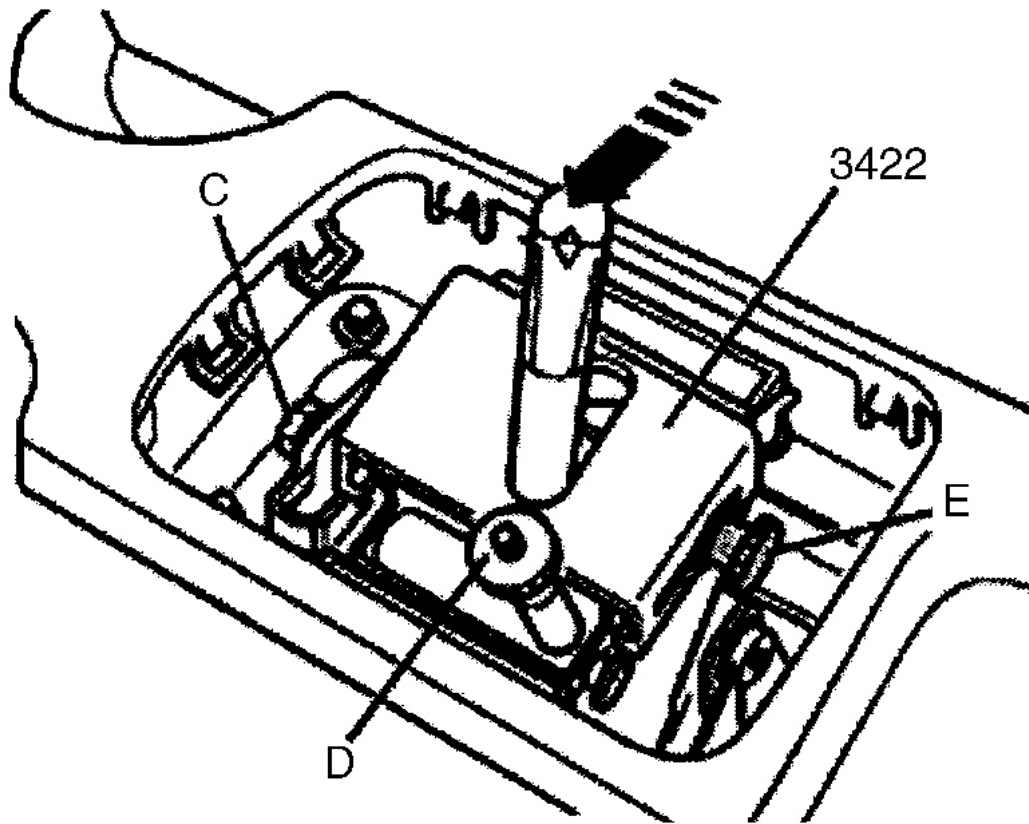
Courtesy of VOLKSWAGEN UNITED STATES, INC.

3. Remove balance weight. Loosen bolt (A) and nut (B), until gear selector cable and actuating arm/gate selector cable are free to move in elongated holes. See **Fig. 10** . Loosen bolt (C), pull off foam seal in area of bolt (C), if necessary. See **Fig. 11** . Insert gear lever jig (3422). Swing jig securing hook under mounting plate, and tighten nut (D). Press gear lever into left-hand detent of sliding piece.



G00370007

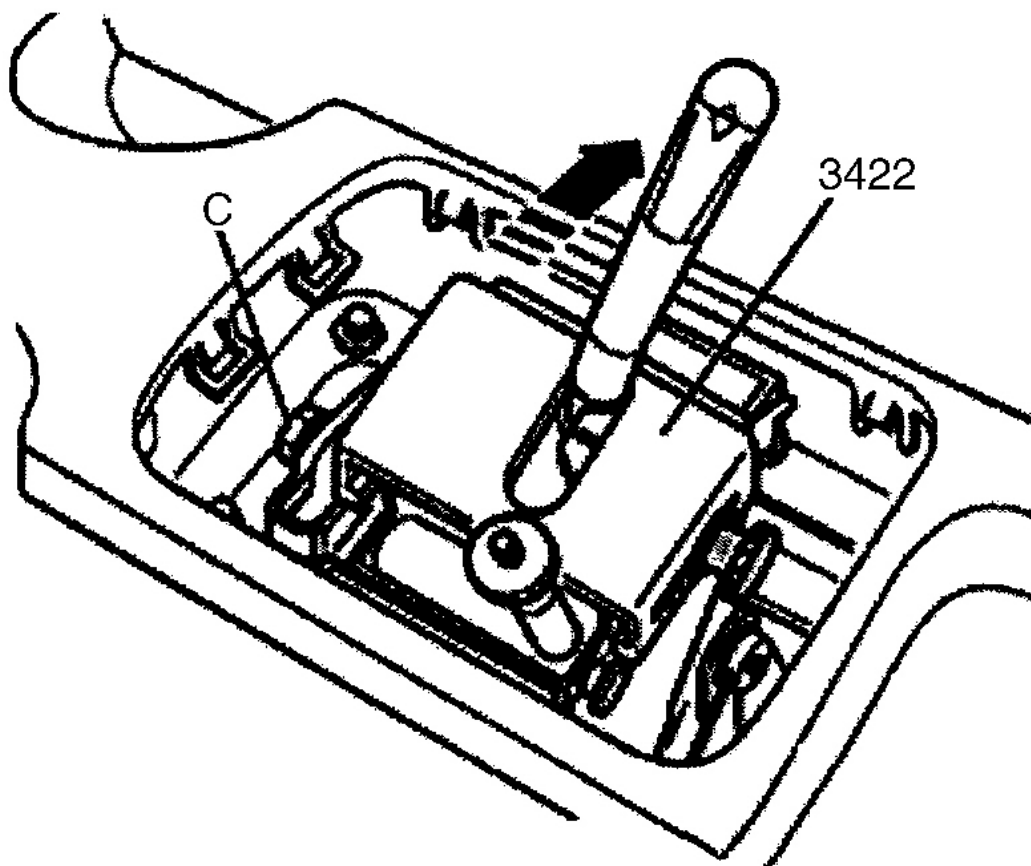
Fig. 10: Loosening Actuating Arm/Gate Selector Cable (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.



G00370093

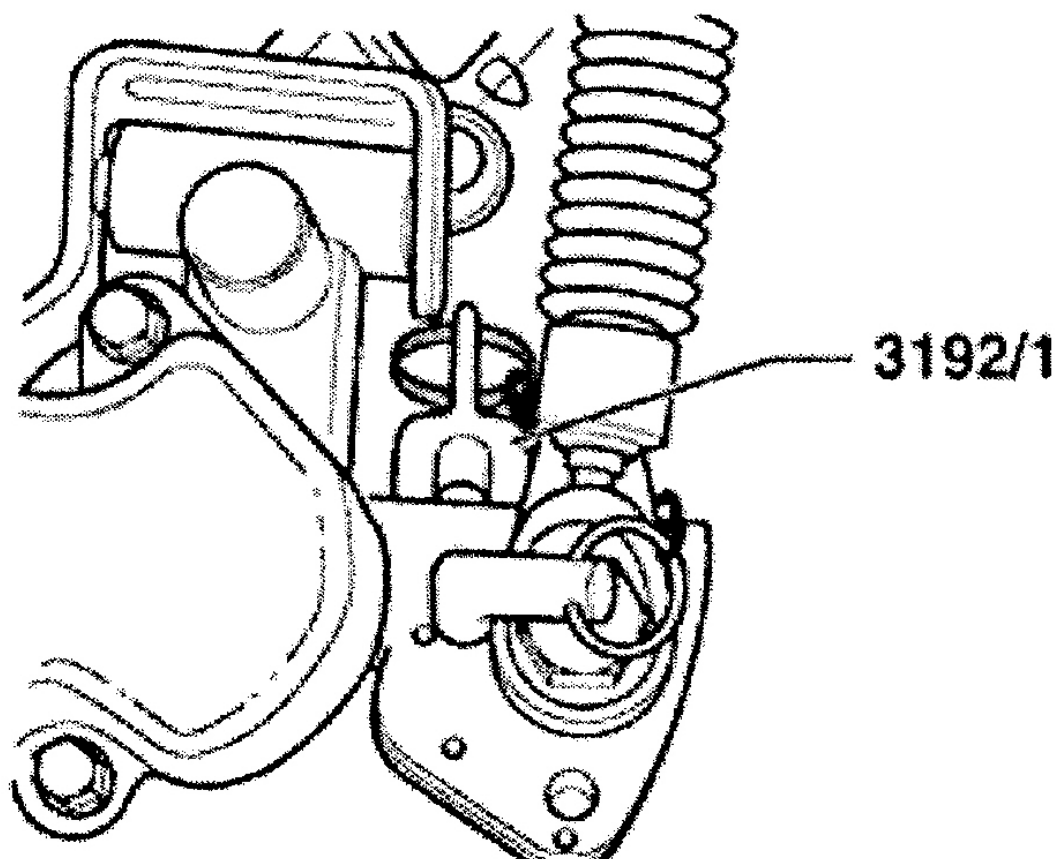
Fig. 11: Installing Gear Lever Jig (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

4. Press gear lever together with sliding piece to left onto stop (direction of arrow). See **Fig. 11** . Tighten sliding piece with bolt (E).
5. Press gear lever into right-hand detent (direction of arrow). See **Fig. 12** . Tighten bolt (C). Insert wedge and pin (3192/1). See **Fig. 13** .



G00370094

Fig. 12: Adjusting Right-Hand Detent (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.



G00370010

Fig. 13: Inserting Wedge & Pin (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

6.

NOTE: Wedge must not lift gear lever.

Slide wedge between gear selector lever and selector cover plate. See **Fig. 13** . Ensure there is no play. In this position, secure gear selector cable and actuating arm/gate selector cable. Check position of wedge. Remove gear lever jig (3422). Install balance weight, gear shift knob and boot.

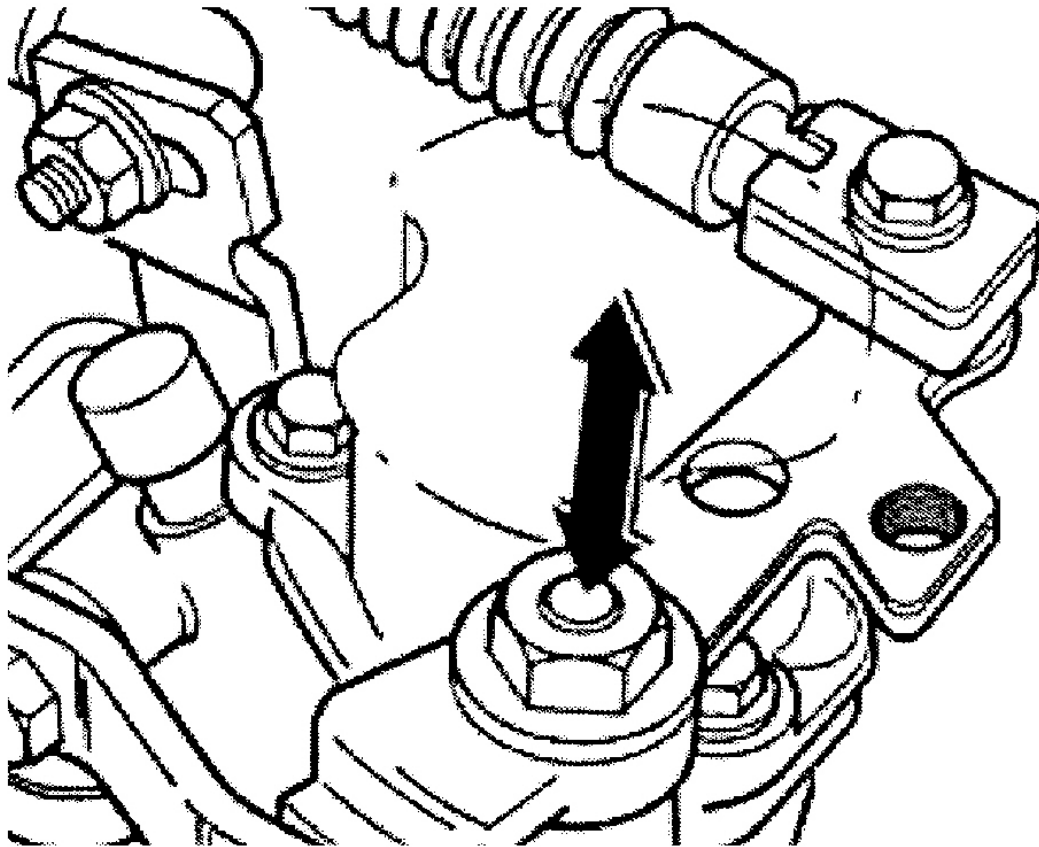
7.

NOTE: Gear shift lever must rest in 3rd/4th gear gate with transmission in Neutral.

Operate clutch. Select all gears several times. Pay particular attention to operation of reverse gear lock. Should a gear fail to engage smoothly after repeated selection, selector shaft play (lift) should be checked.

8. Engage 1st gear. Press gear lever to left, onto stop and release. With aid from a second technician, observe selector shaft in gear box. When moving gear lever, selector shaft must move approximately 1

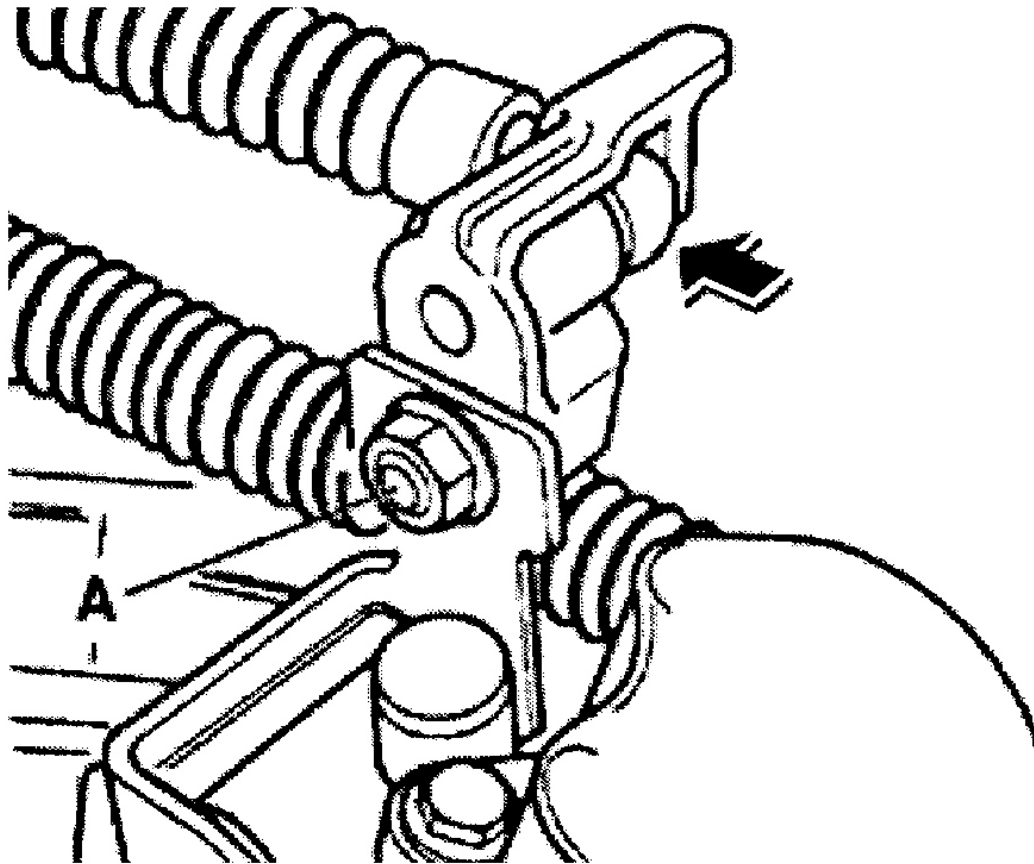
mm (direction of arrow). See **Fig. 14** .



G00370011

Fig. 14: Checking Selector Shaft Movement (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

9. If not, disengage 1st gear and again loosen nut (A) for actuating arm/gate selector cable mounting. (gate selector cable has a certain amount of play at mounting, due to transfer elements). Take up gate selector cable play, by lightly pressing mounting toward bulkhead (direction of arrow). See **Fig. 15** . Tighten nut (A), in this position.



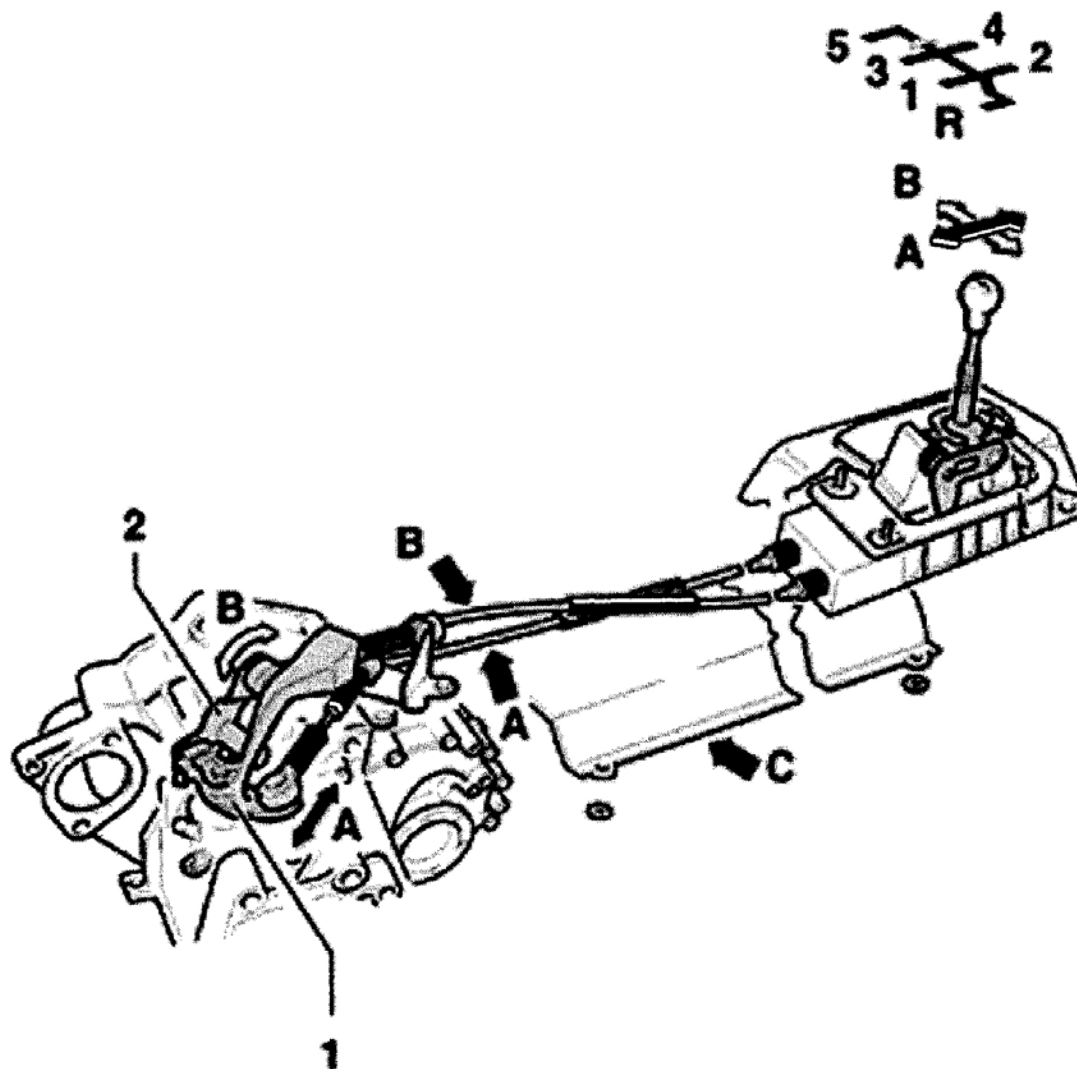
G00370012

Fig. 15: Readjusting Gear Selector Cable (Vehicles Built Up To May 1999)
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Selector Mechanism (Vehicles Built From June 1999)

NOTE: To ensure correct gear selector adjustment, moving parts of selector mechanism and transmission elements must be in proper condition. Selector mechanism must move freely. See Fig. 16 . Transmission, clutch and clutch mechanism must also be in proper condition. Transmission is in Neutral position.

1. Secure locking mechanism on gear selector cable, and gate selector cable, by pulling forward until stop (arrow 1) and then turning to left to lock (arrow 2). See Fig. 17 .



A - Gear change cable

B - Gate selector cable

C - Heat shield

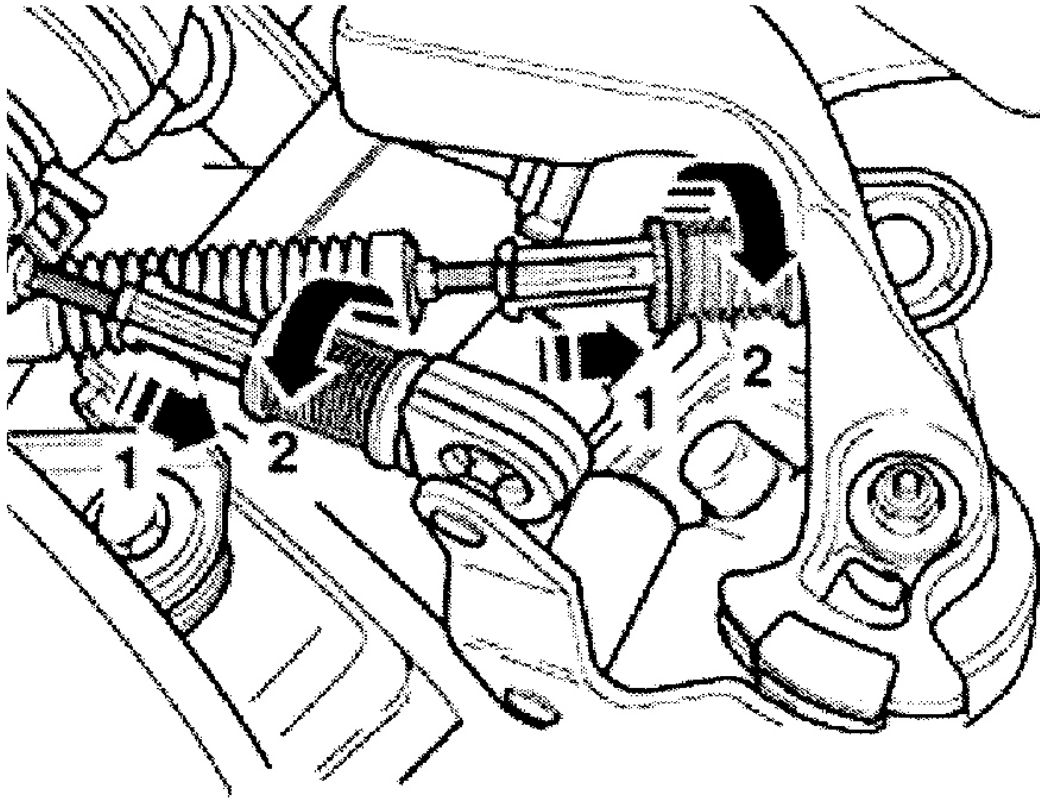
Arrow -A- Gear selection movement

Arrow -B- Gate selection movement

1 - Gear selector lever

2 - Relay lever

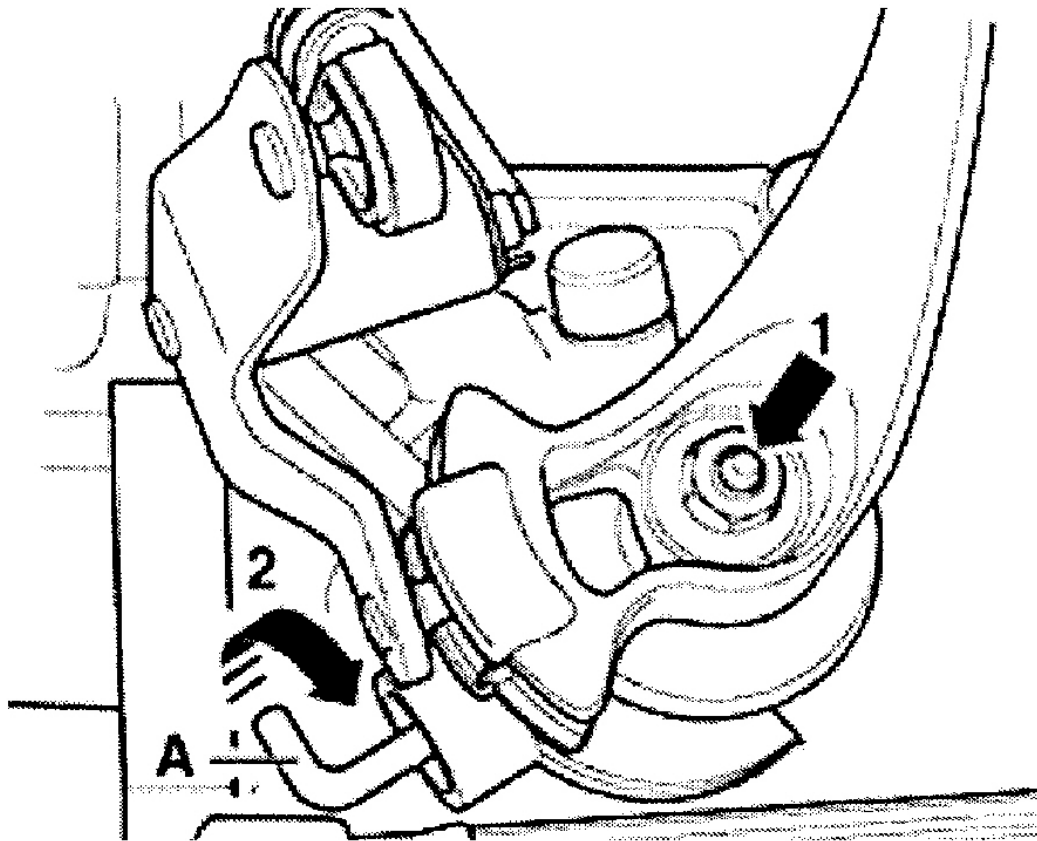
Fig. 16: Identifying Gear Selector Mechanism Components (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.



G00370013

Fig. 17: Securing Locking Mechanism (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

2. Press selector shaft down (direction of arrow 1). See **Fig. 18** . Turn right-angle piece (A) in direction of arrow (2), when pressing selector shaft down.

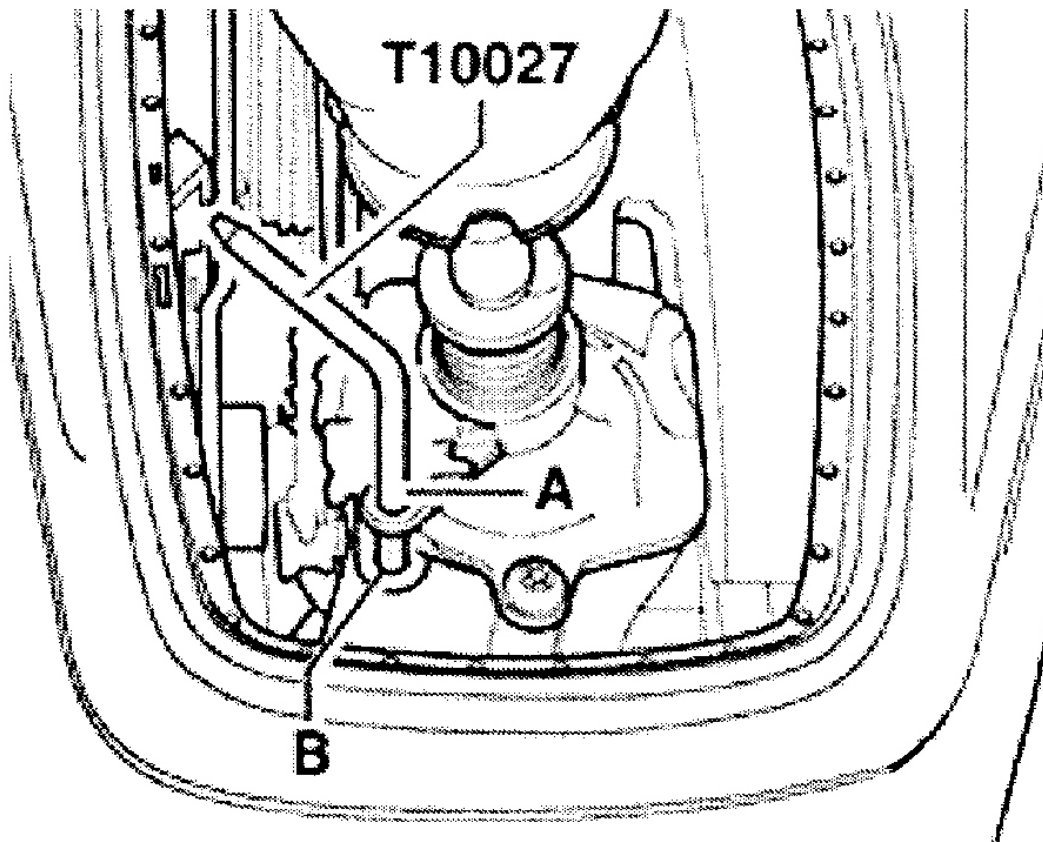


G00370014

Fig. 18: Setting Selector Shaft (Vehicles Built From June 1999)

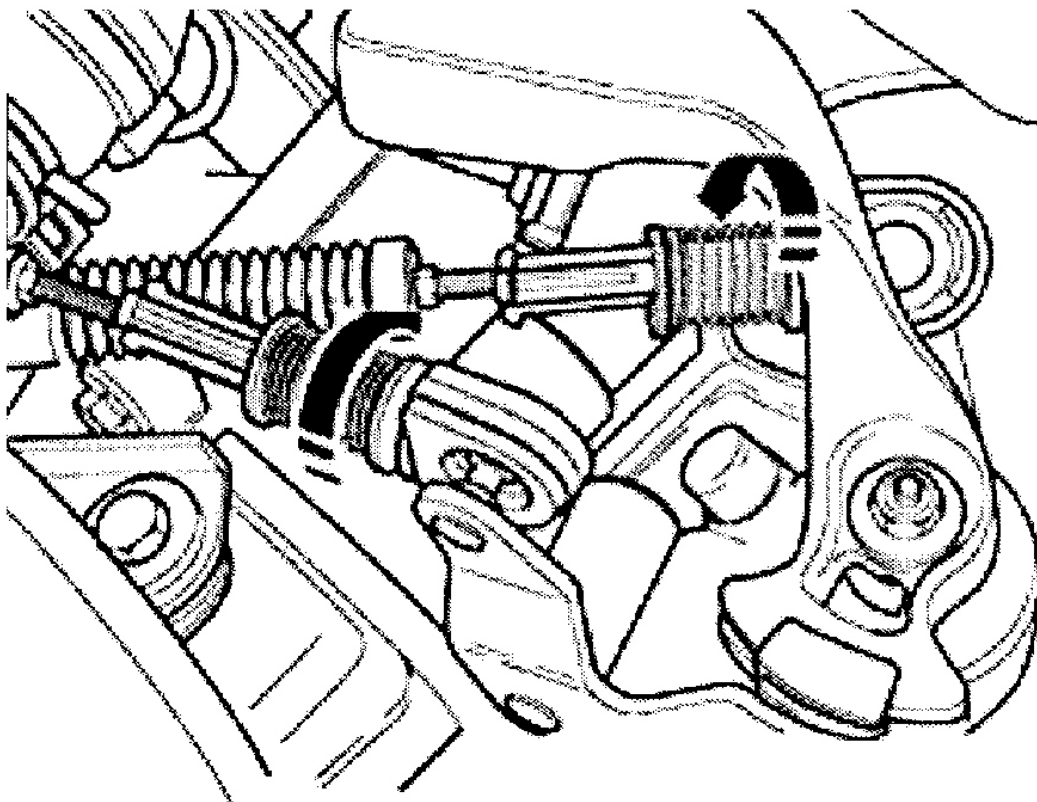
Courtesy of VOLKSWAGEN UNITED STATES, INC.

3. Pull gear shift boot off center console (arrow). See **Fig. 7** . Pull rubber cover toward gear shift knob, if part of original equipment.
4. Select Neutral with gear lever. Guide pin (T10027) through hole (A) and into hole (B). See **Fig. 19** . Turn locking mechanism on gear selector cable and gate selector cable to right onto stop (direction of arrow). See **Fig. 20** . Spring presses locking mechanism into normal position.



G00370015

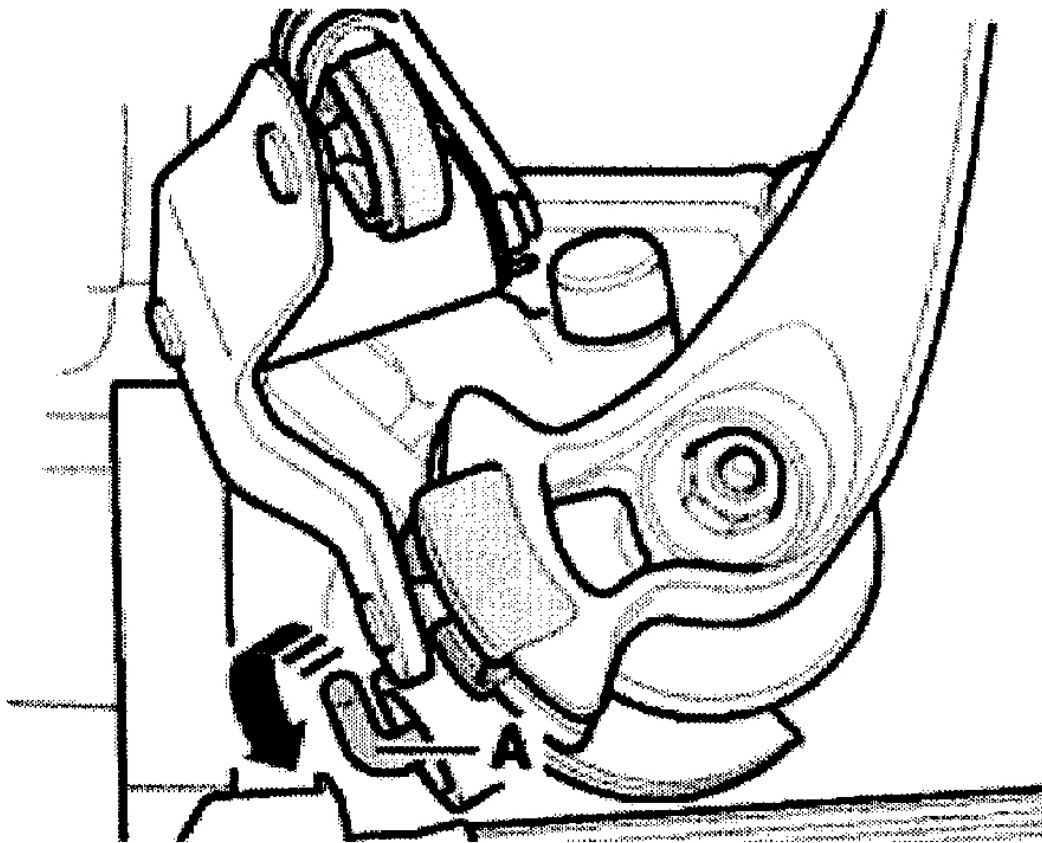
Fig. 19: Setting Gear Lever (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.



G00370016

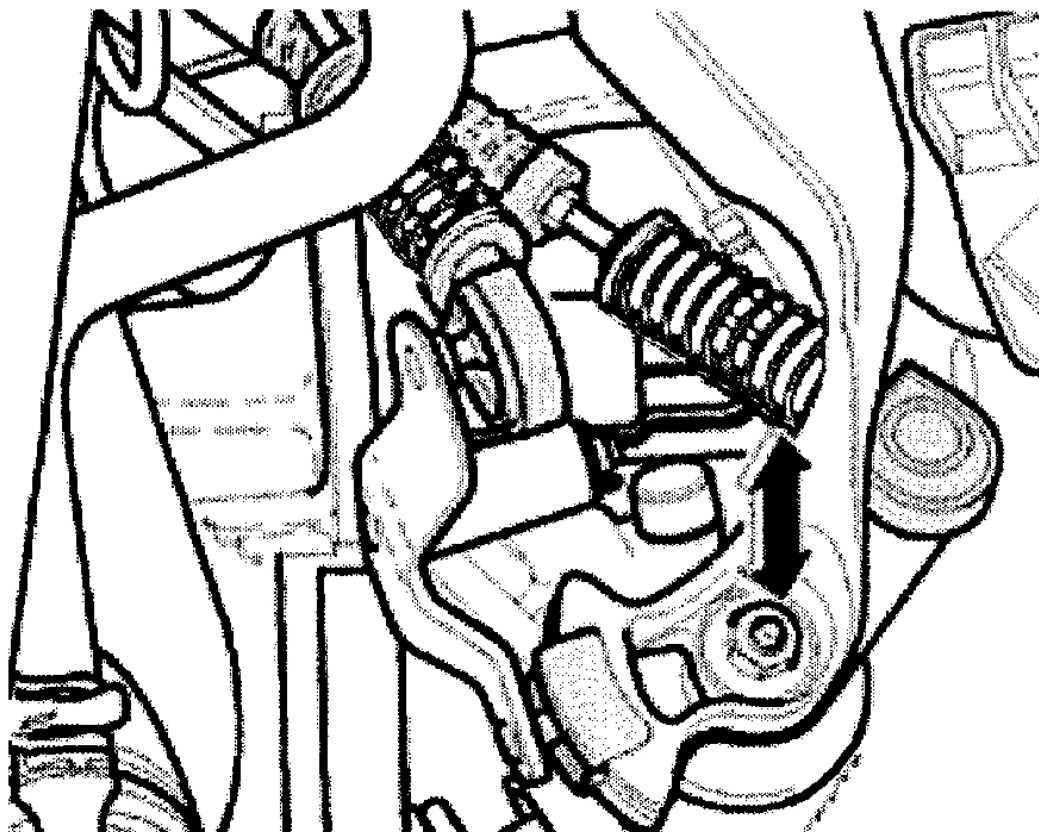
Fig. 20: Turning Locking Mechanism (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. Turn right-angled piece (A) back to original position (direction of arrow). See **Fig. 21** . Selector shaft must now be able to be moved in direction of arrow. See **Fig. 22** .



G00370017

Fig. 21: Turning Right-Angled Piece (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.



G00370018

Fig. 22: Moving Selector Shaft (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

6. Pull pin (T10027) out of holes (A and B). See **Fig. 19** . Clip boot into frame.
- 7.

NOTE: **Gear shift lever must rest in 3rd/4th gear gate with transmission in Neutral.**

Operate clutch. Select all gears several times. Pay particular attention to operation of reverse gear lock. Should a gear fail to engage smoothly after repeated selection, selector shaft play (lift) should be checked.

8. Engage 1st gear. Press gear lever to left, onto stop and release. With aid from a second technician, observe selector shaft in gear box. When moving gear lever, selector shaft must move approximately 1 mm (direction of arrow). See **Fig. 22** . If selector shaft does not move, repeat adjustment.

BATTERY DISCONNECT PRECAUTIONS

CAUTION: Turn ignition switch to OFF position. Before disconnecting negative

battery terminal, obtain anti-theft radio security code. Disconnect negative battery terminal. After reconnecting battery, re-code and check operation of anti-theft radio.

Do not loosen or remove ground strap from body. Disconnect terminal from battery only.

Once battery has been connected, check operation of radio, clock and convenience electronics. Completely open and close all power windows.

ECM

If connector is disconnected from ECM or battery is disconnected, all adaptation values in control module are erased. DTC memory content will remain intact however. If engine is started after this, a rough, uneven idle can result. In this case, engine must be allowed to run at idle for a few minutes or a longer road test must be performed until adaptation procedure has been completed.

NOTE: Vehicles with On Board Diagnostics (OBD) II must have readiness code for Electronic Control Module (ECM) re-generated after battery has been disconnected. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

REMOVAL & INSTALLATION

NOTE: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle.

CAUTION: Radio/cassette or radio/CD player is equipped with an anti-theft protection circuit. Whenever battery is disconnected, radio will go into anti-theft mode. When battery is reconnected, radio will display CODE, and will be inoperative until proper code number is entered. Obtain security code before disconnecting battery.

CLUTCH ASSEMBLY

Removal

Remove transmission. See **TRANSMISSION**. Install Flywheel Holder (3067) on flywheel. Remove pressure plate bolts, evenly in stages and alternating in a diagonal pattern. Supporting clutch disc, remove pressure plate and disc. See **Fig. 23**.

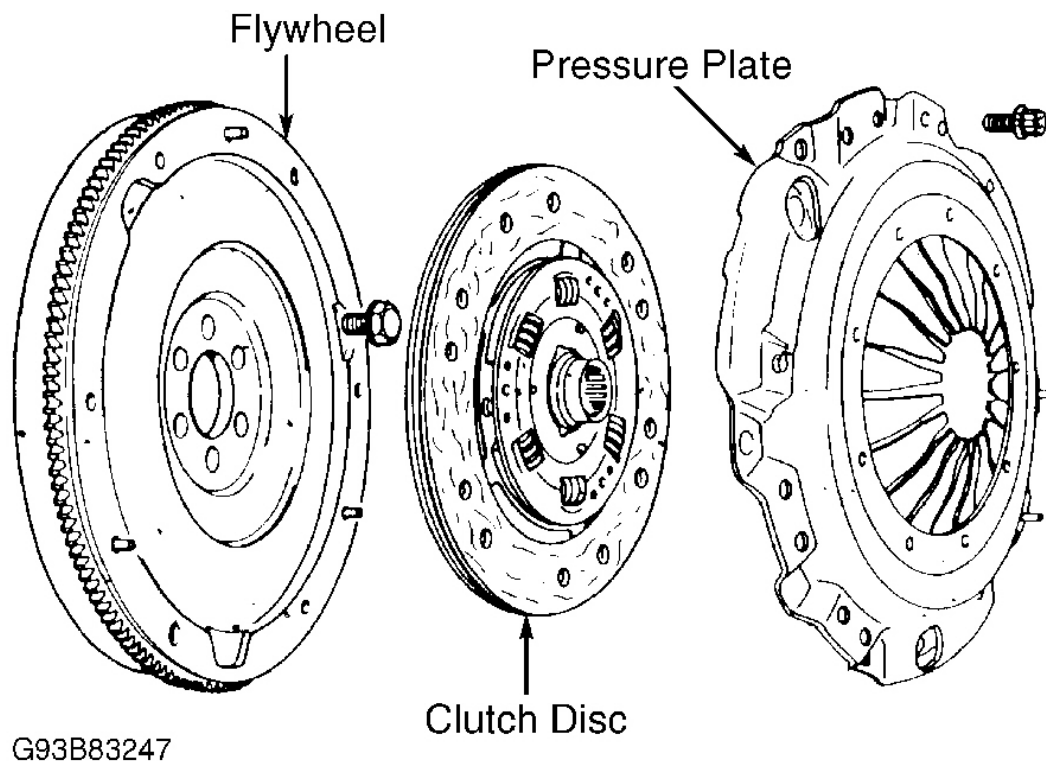


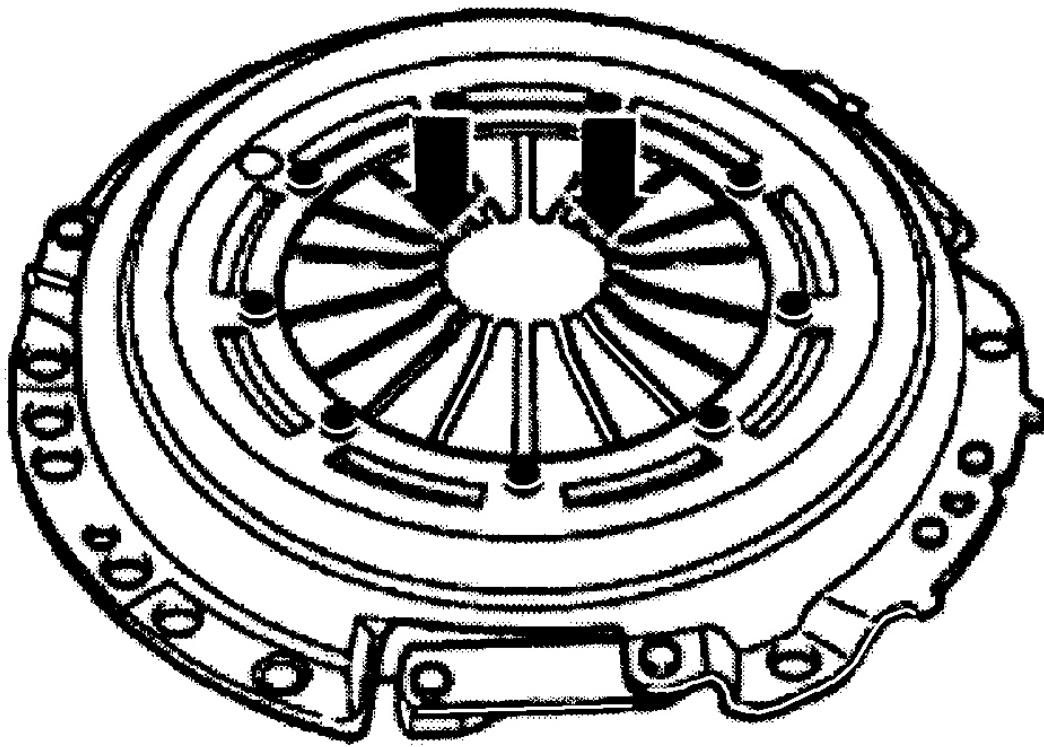
Fig. 23: Exploded View Of Clutch Assembly
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Inspection

1. Inspect pressure plate surface for wear, cracks, burning or warpage. Inspect clutch release bearing for smooth operation and looseness. Replace bearing if noisy. DO NOT wash release bearing in solvent.
- 2.

NOTE: Pressure plate has a protective grease coating. Remove contact surface grease only. Service life will be shortened if remaining portions of pressure plate protective grease are removed.

Inspect pressure plate diaphragm springs. Wear up to half thickness of diaphragm spring is permitted. See **Fig. 24** .



G00366647

Fig. 24: Inspecting Pressure Plate Diaphragm Spring
Courtesy of VOLKSWAGEN UNITED STATES, INC.

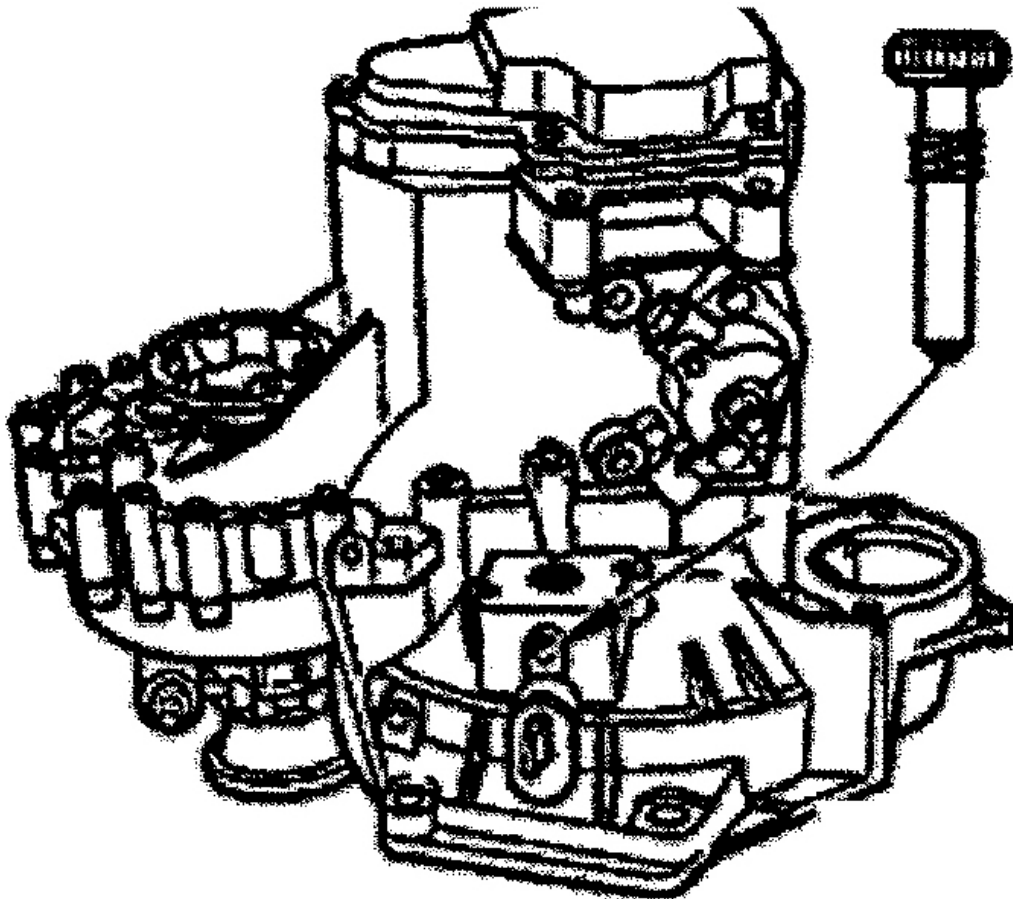
3. Inspect clutch disc lining for excessive wear and burned or oil-soaked condition. Inspect clutch disc for loose rivets and torsion dampers. Measure clutch disc and flywheel runout. Inspect flywheel ring gear teeth for wear and damage.

NOTE: Replace clutch plates and pressure plates that have damaged or loose rivets.

4. Inspect flywheel for wear, cracks and burned condition. Ensure centering pins are a tight fit. Contact surface for clutch lining must be free of grooves, oil and grease.

Installation

NOTE: Before installing transmission, press clutch release lever toward transmission housing and secure it with an assembly pin, assembly bolt or a M8 x 35 bolt. Remove pin or bolt after transmission has been installed. Hole will then be sealed by 3rd cable support bracket securing bolt. See [Fig. 25](#) .



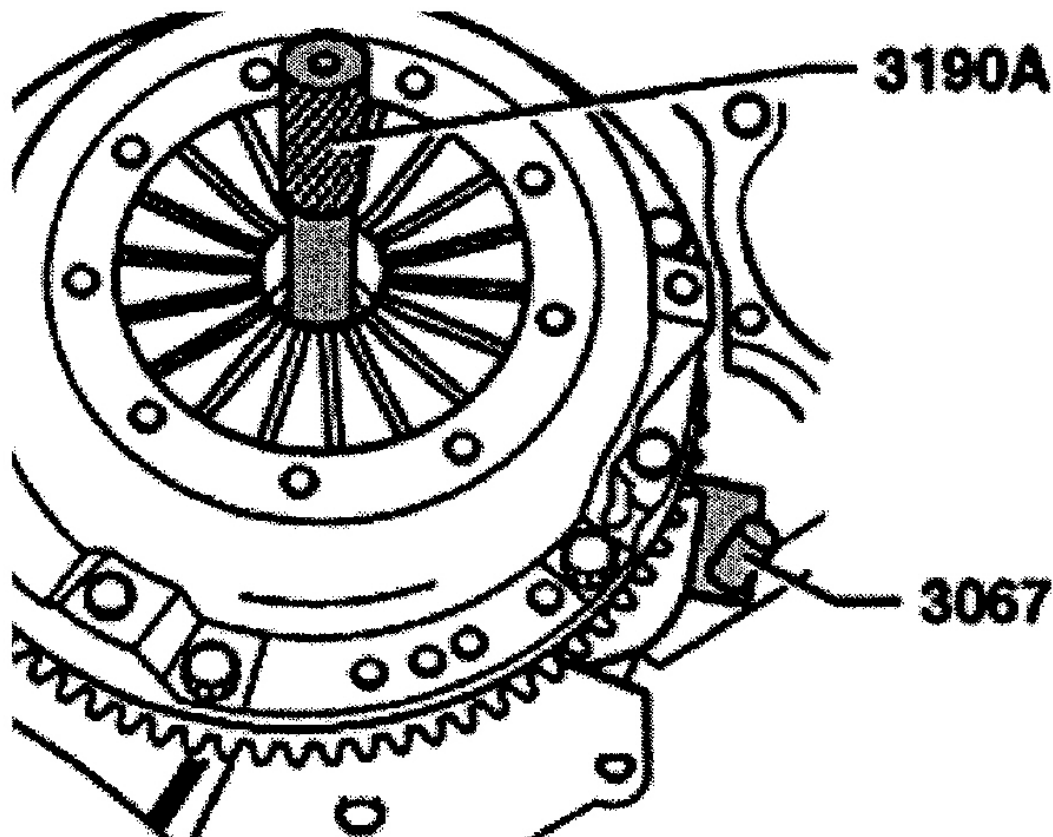
G00204353

Fig. 25: Securing Clutch Release Lever

Courtesy of VOLKSWAGEN UNITED STATES, INC.

1. To install, reverse removal procedure. Clean input shaft splines and on used clutch plates, the hub splines. Remove corrosion and apply only a very thin coating of grease Part No. G 000 100 to input shaft splines. Then move clutch plate back and forth on input shaft until hub moves freely. Excess grease must be removed.
2. On models with dual mass flywheel, installed position of clutch disc have a shorter hub end pointing toward pressure plate. On models with single piece flywheel, installed position of clutch disc spring cage faces pressure plate.
3. Apply grease to ball stud and inner surface of release bearing.
4. Install pressure plate bolts finger tight. Using clutch centering tool (3190A), align clutch disc and pilot bushing holes. See **Fig. 26** . Pressure plate contact surface and clutch plate must make full contact with

flywheel. Tighten bolts diagonally and evenly to prevent damage to the centering holes in the pressure plate housing and the centering pins in the flywheel. See **TORQUE SPECIFICATIONS**.



G00370024

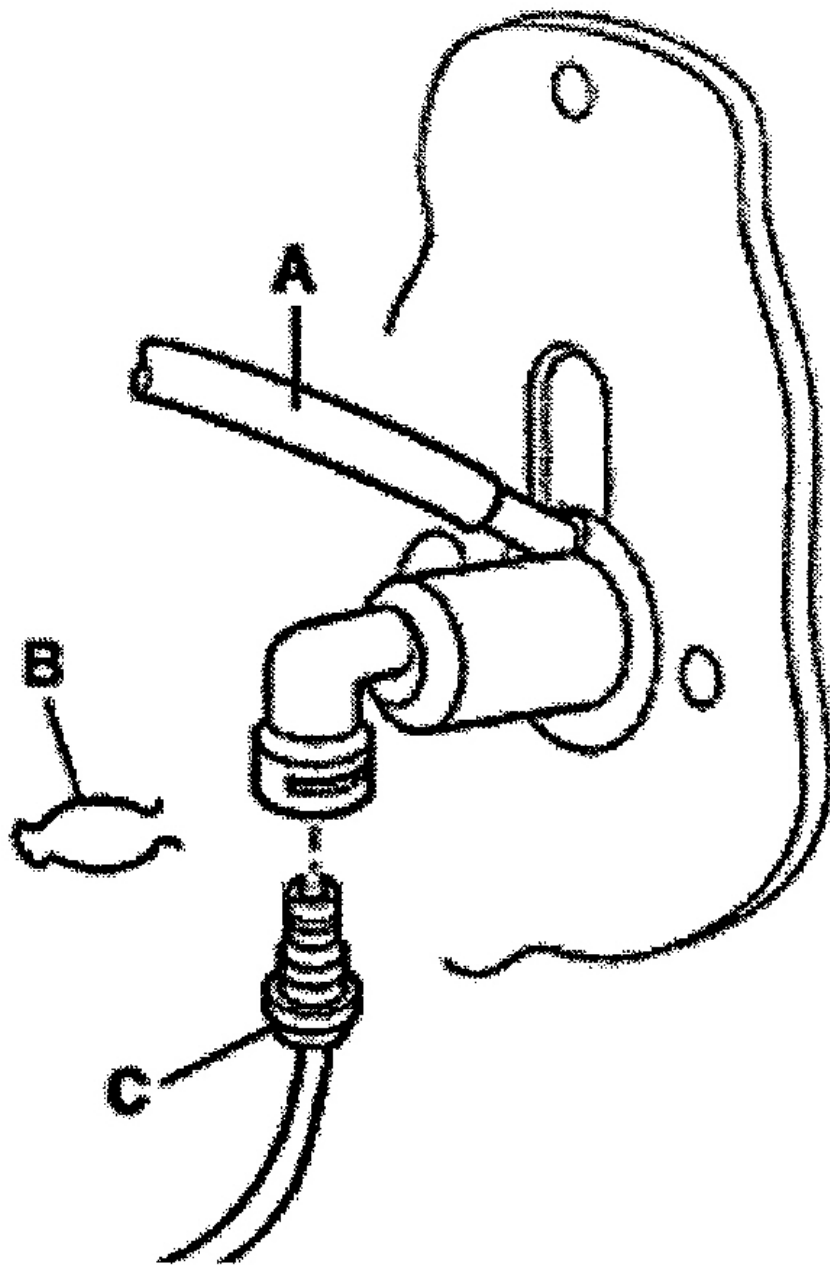
Fig. 26: Aligning Clutch Disc

Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. Using flywheel lock (3067) or similar device, hold crankshaft from turning. Tighten flywheel bolts to specification. See **TORQUE SPECIFICATIONS**. Ensure transmission oil level is correct.

CLUTCH MASTER CYLINDER

1. Remove intake hose (1), connector (2) and vacuum hose (3) from mass air flow sensor. See **Fig. 9**. Remove complete air cleaner assembly housing by removing 2 bolts. On vehicles with 2.0L engine, remove protective housing for relays from cable channel.
2. Pull off supply hose (A) to brake fluid reservoir and plug hose. See **Fig. 27**. Pry clip (B) for line/hose assembly out of clutch master cylinder. Pull line/hose assembly (C) out of clutch master cylinder and plug to prevent fluid leakage.

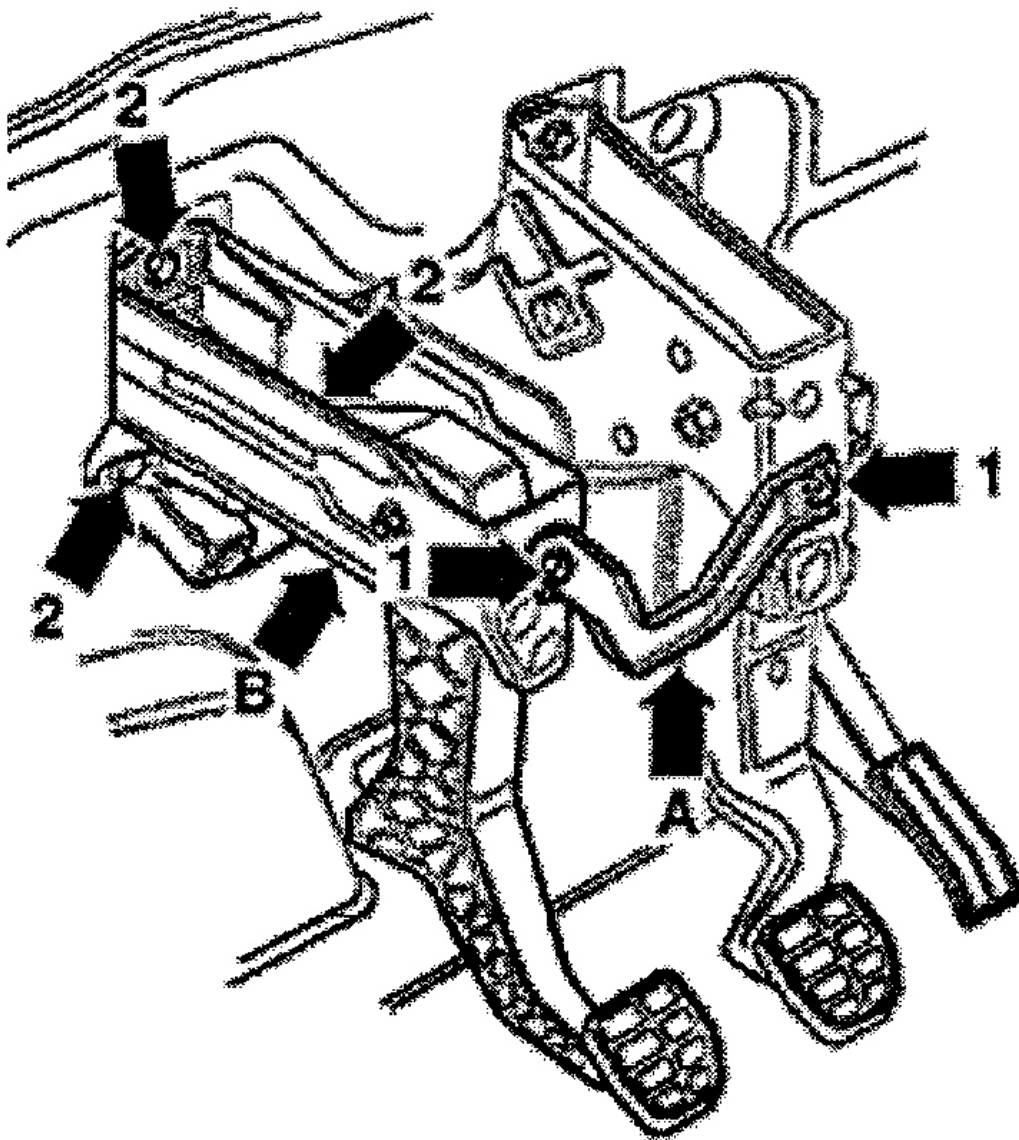


G00204288

Fig. 27: Removing Supply Hose, Clip & Line/Hose Assembly
Courtesy of VOLKSWAGEN UNITED STATES, INC.

3. Remove driver's side lower trim panel cover. To remove clutch master cylinder, complete clutch pedal

mounting bracket must be removed. Remove connecting plate bolts (1) and plate (A). See **Fig. 28** . Remove securing nuts (2) for mounting bracket (B). Remove mounting bracket.

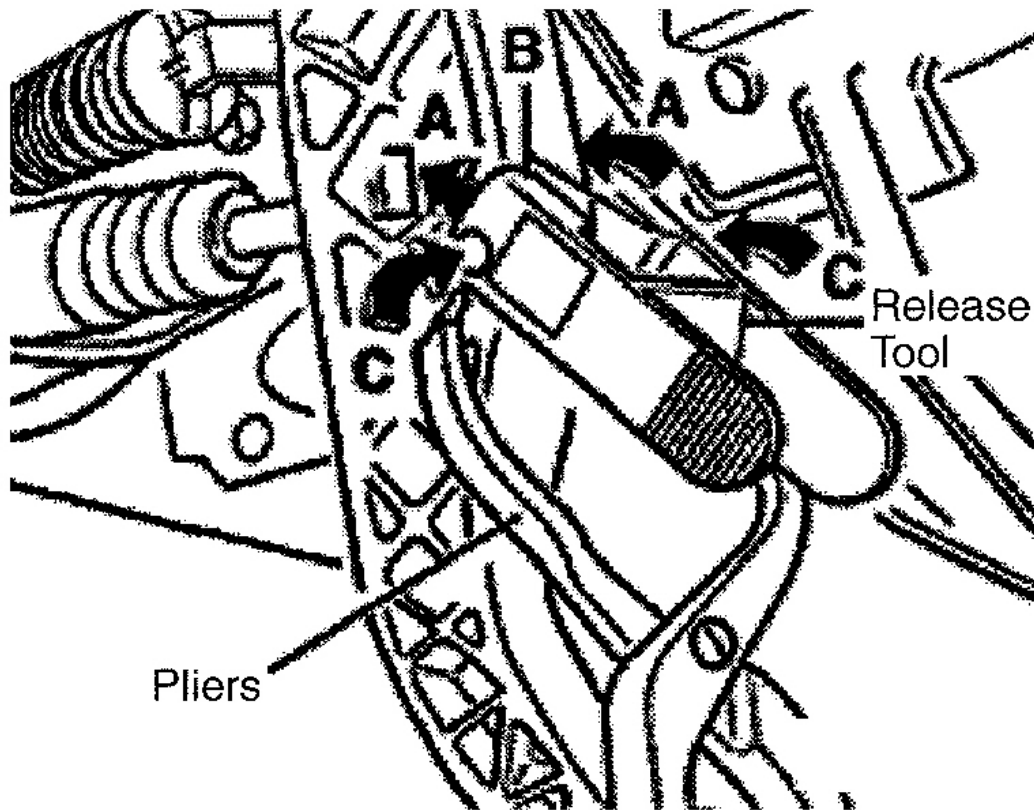


G00204289

Fig. 28: Removing Clutch Pedal Mounting Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

4. Separate clutch master cylinder rod from clutch pedal by, inserting Release Tool (3309) into clutch pedal cut outs (A). See **Fig. 29** . Inscription (B, top/open) on release tool points away from clutch pedal. Using

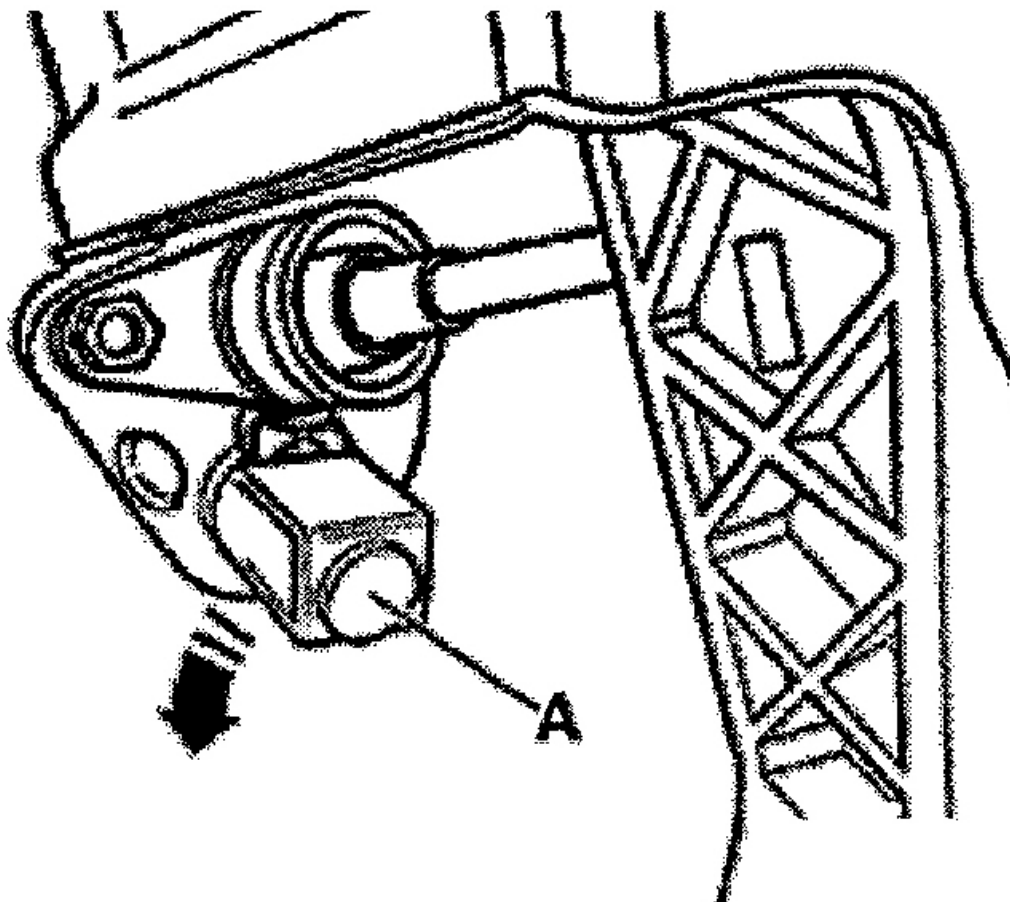
pliers positioned in recesses (C), press release tool together.



G00204290

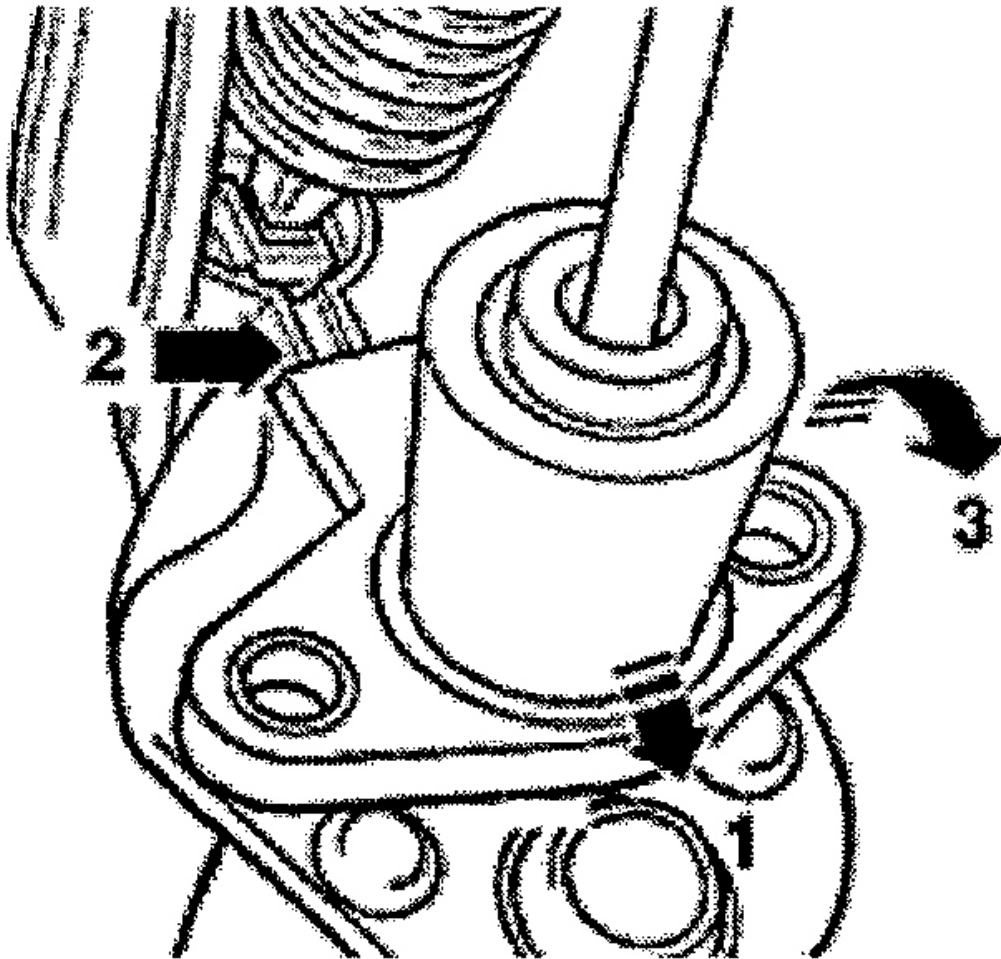
Fig. 29: Separating Master Cylinder From Clutch Pedal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. Turn stop (A) for clutch pedal in a counterclockwise direction and remove stop. See **Fig. 30** . Push clutch master cylinder downward (1) onto stop. See **Fig. 31** . Clutch master cylinder must not be covered in upper area by overcenter spring mounting (2). Swing clutch master cylinder in direction of arrow (3) and remove from mounting bracket.



G00204291

Fig. 30: Turning Stop For Clutch Pedal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

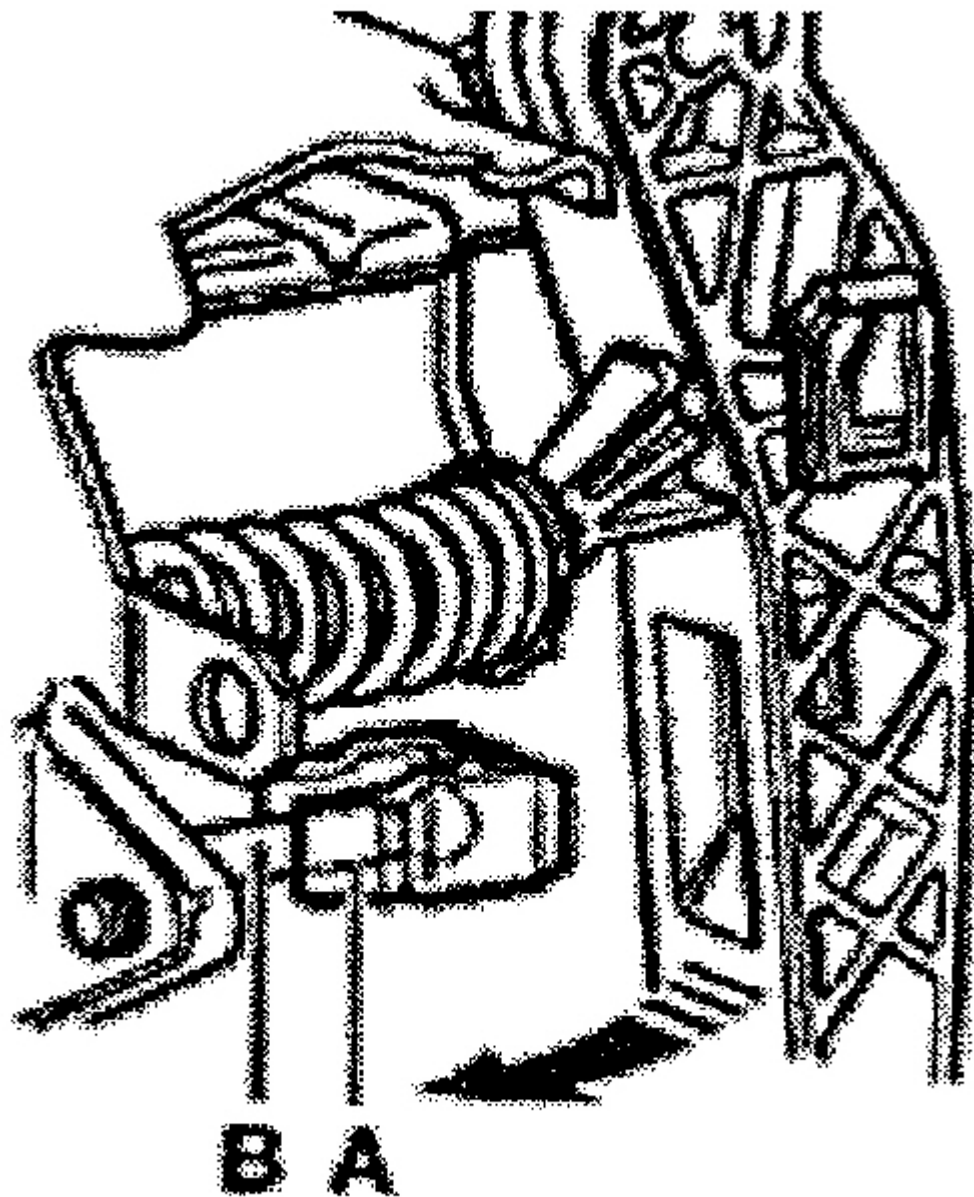


G00204292

Fig. 31: Removing Clutch Master Cylinder

Courtesy of VOLKSWAGEN UNITED STATES, INC.

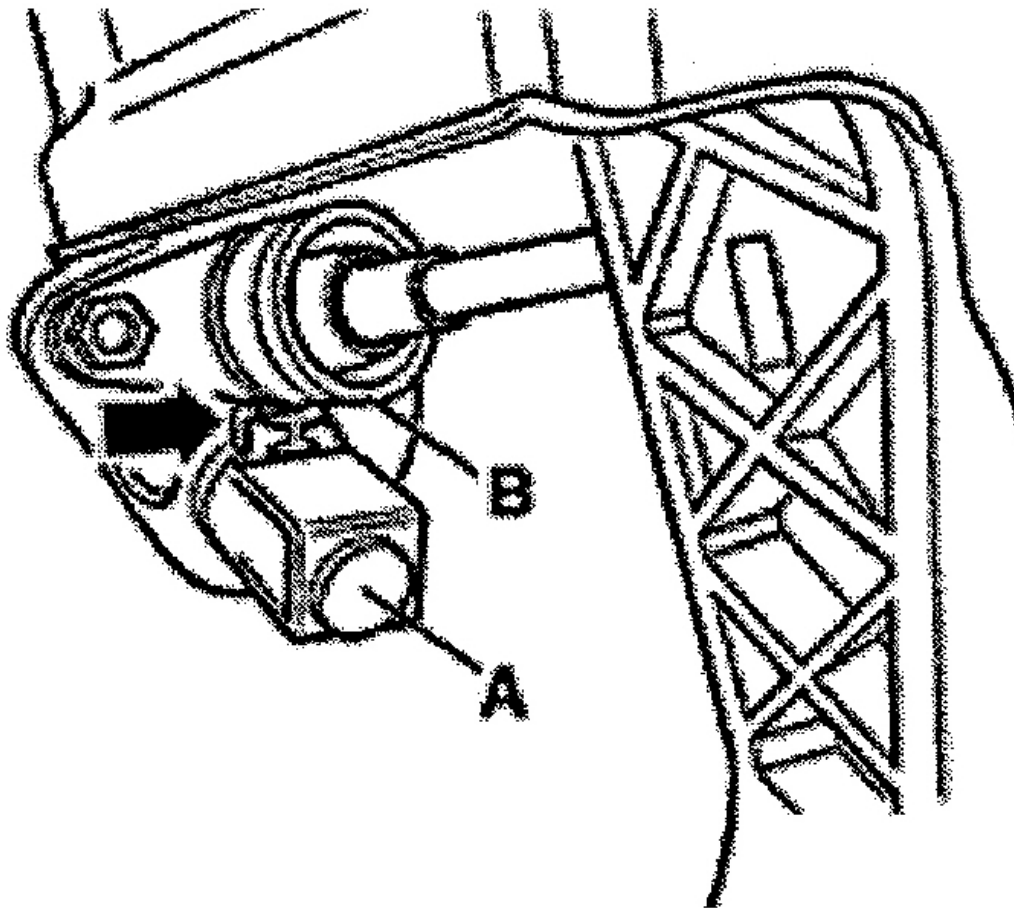
6. To install, reverse removal procedure. Fit retainer (A) to clutch master cylinder operating rod (B). See **Fig. 32** . Press clutch pedal in direction of arrow to engage. Ensure retainer is installed in correct location.



G00204293

Fig. 32: Installing Retainer To Operating Rod
Courtesy of VOLKSWAGEN UNITED STATES, INC.

7. Fit stop (A) for clutch pedal. Arm (arrow) points toward clutch master cylinder (B). See **Fig. 33** . Bleed clutch system after installing clutch master cylinder. See **BLEEDING** .



G00204294

Fig. 33: Fitting Stop For Clutch Pedal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

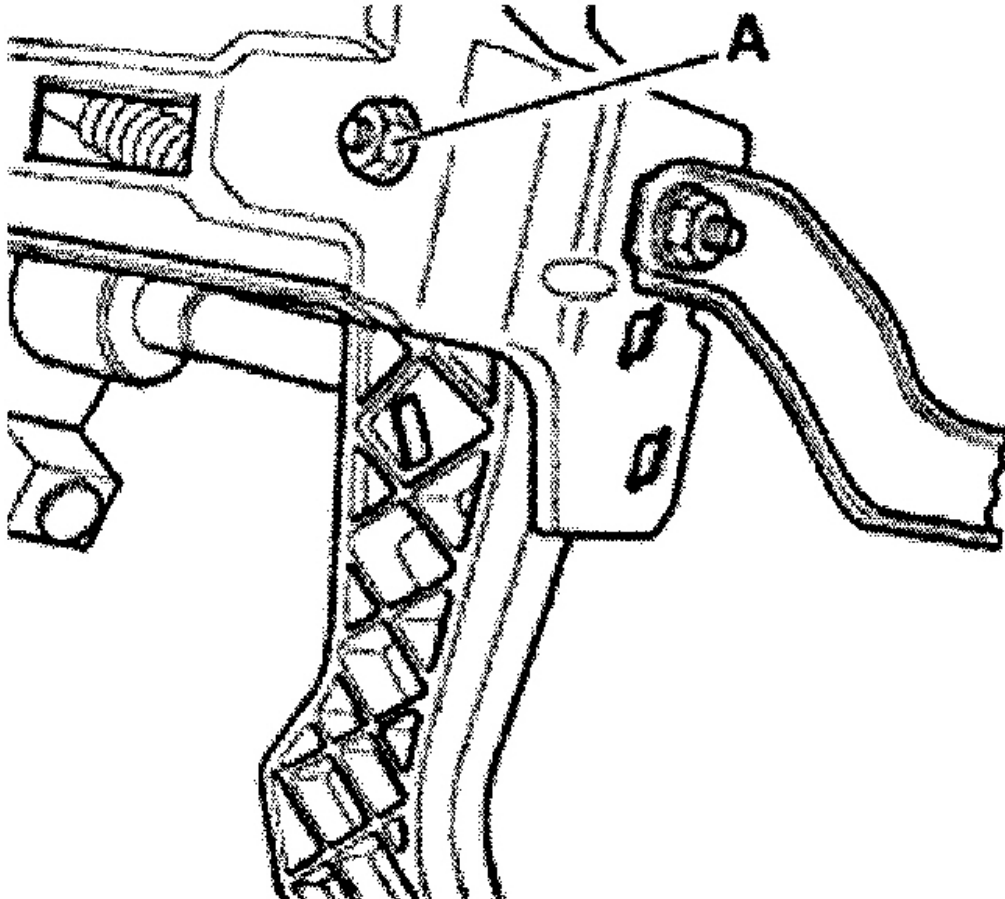
CLUTCH PEDAL

Removal & Installation

1. Remove overcenter spring. See **OVERCENTER SPRING** .
2. Separate clutch master cylinder rod from clutch pedal by, inserting Release Tool (3309) into clutch pedal cut outs (A). See **Fig. 29** . Inscription (B, top/open) on release tool points away from clutch pedal. Using

pliers positioned in recesses (C), press release tool together.

3. Push operating rod toward engine compartment until stopped. Remove nut (A). See **Fig. 34** . Pull bolt out until clutch pedal can be removed.



G00204296

Fig. 34: Removing Clutch Pedal

Courtesy of VOLKSWAGEN UNITED STATES, INC.

4. To install, reverse removal procedure. Install overcenter spring. Fit retainer (A) to clutch master cylinder operating rod (B). See **Fig. 32** . Press clutch pedal in direction of arrow to engage. Ensure retainer is installed in correct location.
5. Fill brake fluid reservoir up to "MAX" marking. Bleed clutch system when fluid level is below "MIN" marking. after installing clutch master cylinder. See **BLEEDING** .

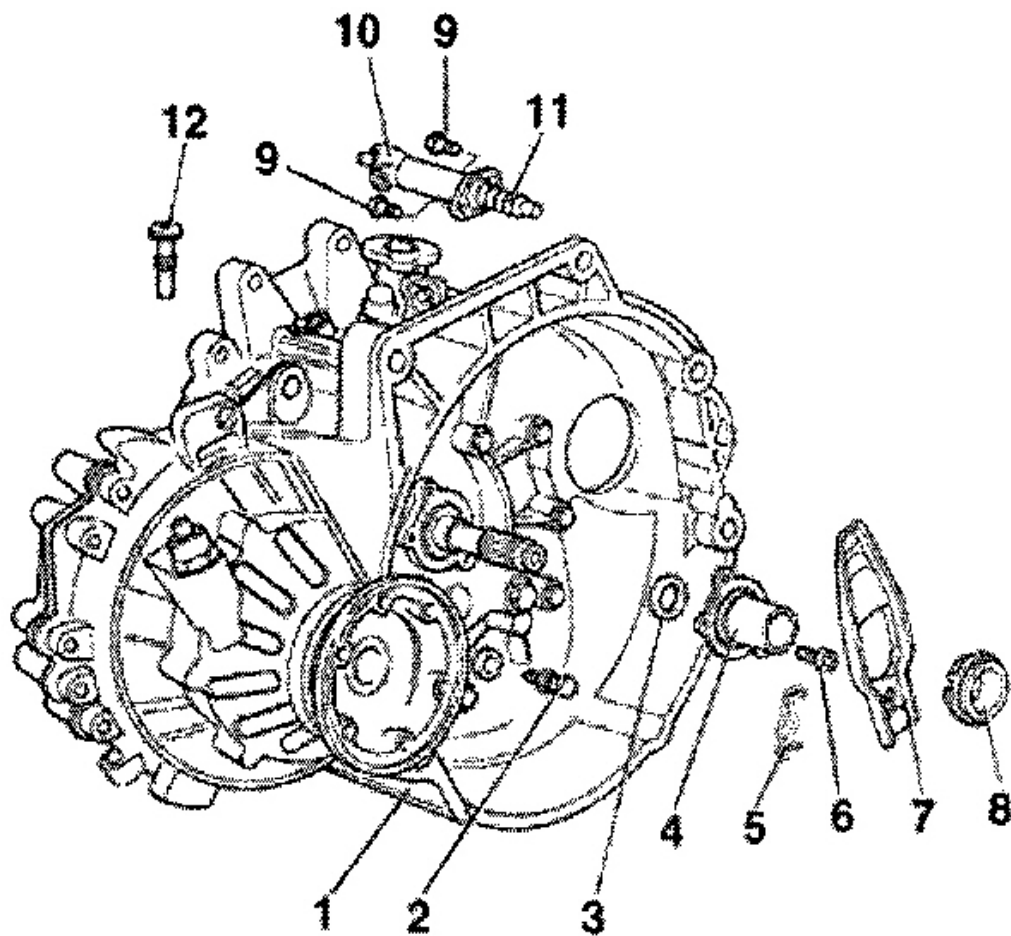
CLUTCH RELEASE BEARING

Removal & Installation

CAUTION: DO NOT wash out bearing. Replace noisy bearing.

NOTE: Inspect clutch release bearing for smooth operation and looseness. Replace bearing if noisy. DO NOT wash release bearing in solvent.

Removal information not available from manufacturer. Use **Fig. 35** as an aid for procedure. If damaged, replace guide sleeve and O-ring together. Lubricate guide sleeve in area of release bearing with MoS2 grease. Lubricate surfaces which contact release lever with MoS2 grease. Grease end of slave cylinder plunger with MoS2 grease.



- | | |
|-------------------------|-------------------------|
| 1. Transaxle | 7. Clutch Release Lever |
| 2. Ball Stud | 8. Release Bearing |
| 3. Input Shaft Oil Seal | 9. Slave Cylinder Bolt |
| 4. Guide Sleeve | 10. Slave Cylinder |
| 5. Retaining Spring | 11. Plunger |
| 6. Securing Bolt | 12. Assembly Bolt |

G00204295

Fig. 35: Identifying Clutch Release Components
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

CLUTCH SLAVE CYLINDER

Removal & Installation

Full removal and installation procedure is not available from manufacturer. See **Fig. 35** for location.

Before removing slave cylinder, remove gear selector cable from gear selector lever. Remove relay lever and actuating arm for gate selector cable. After installing adjust gear selector mechanism. See **SELECTOR MECHANISM** under ADJUSTMENTS.

OVERCENTER SPRING

Removal & Installation

1. Remove driver's side lower cover. Install Assembly Clamp (T10111) from right side, onto overcenter spring. See **Fig. 36** . Ensure assembly clamp is correctly seated. Clamp must be positioned on rear part of overcenter spring so claws fit over web (1). Press clutch pedal lightly toward bulkhead. Hook tab (2) of assembly clamp into cutout of overcenter spring.

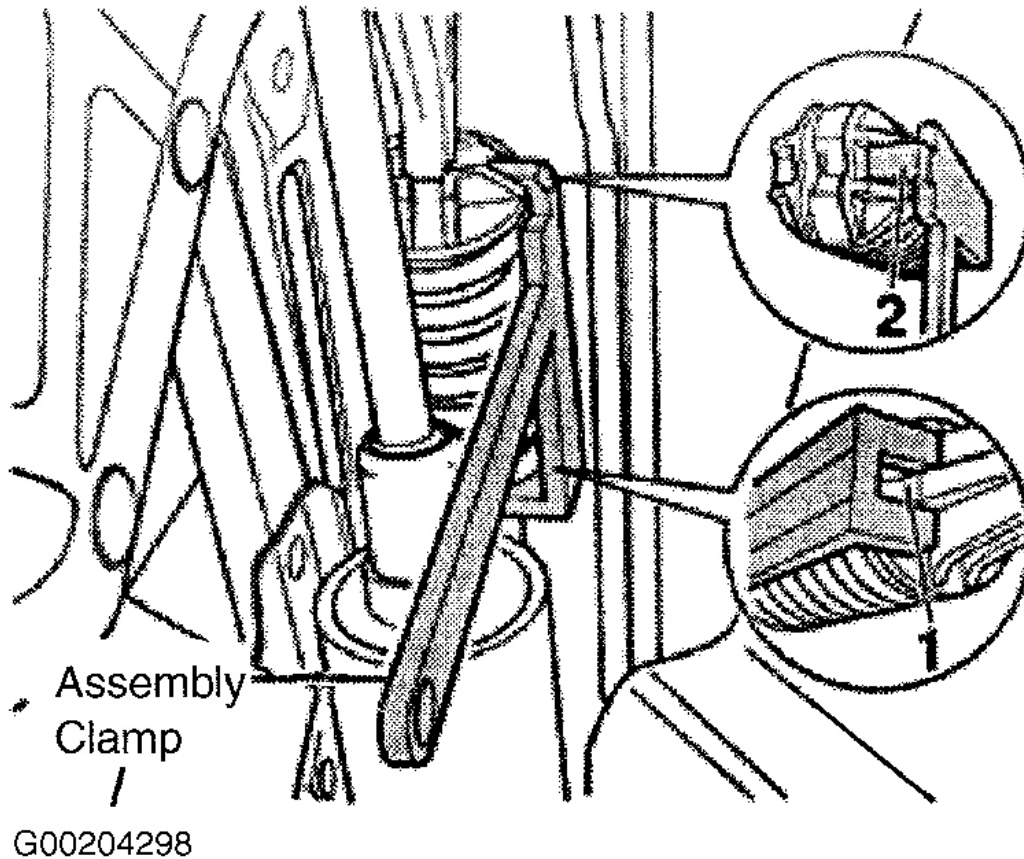
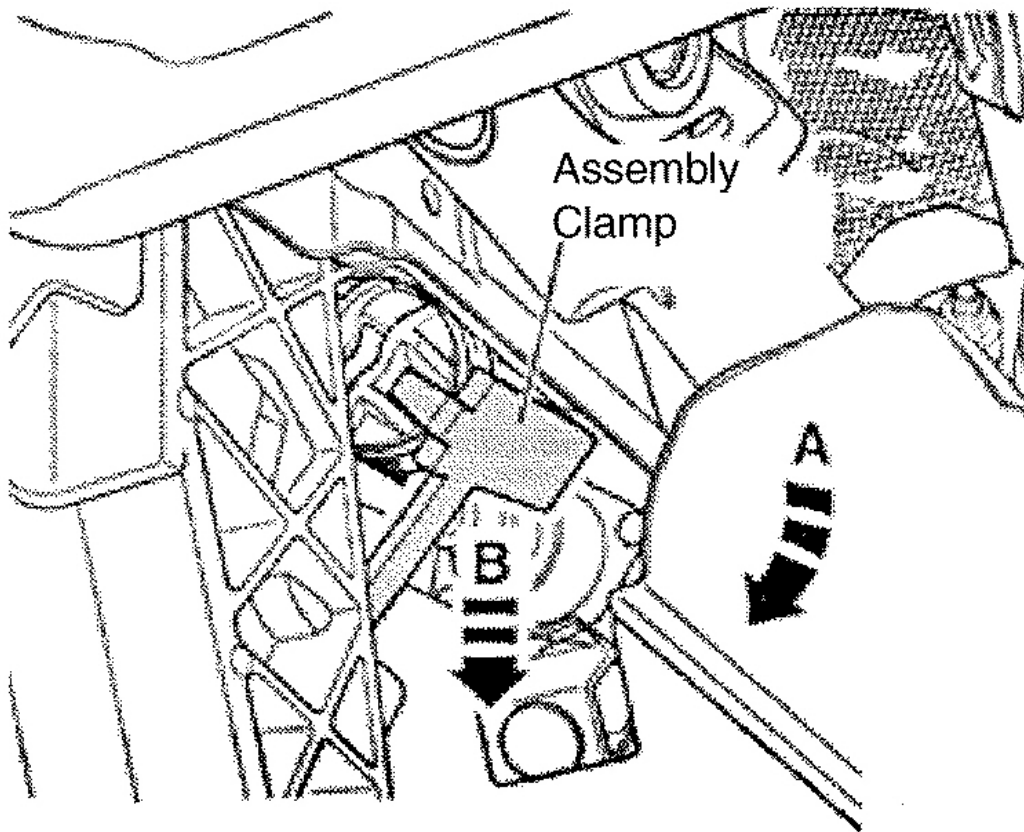


Fig. 36: Installing Assembly Clamp
Courtesy of VOLKSWAGEN UNITED STATES, INC.

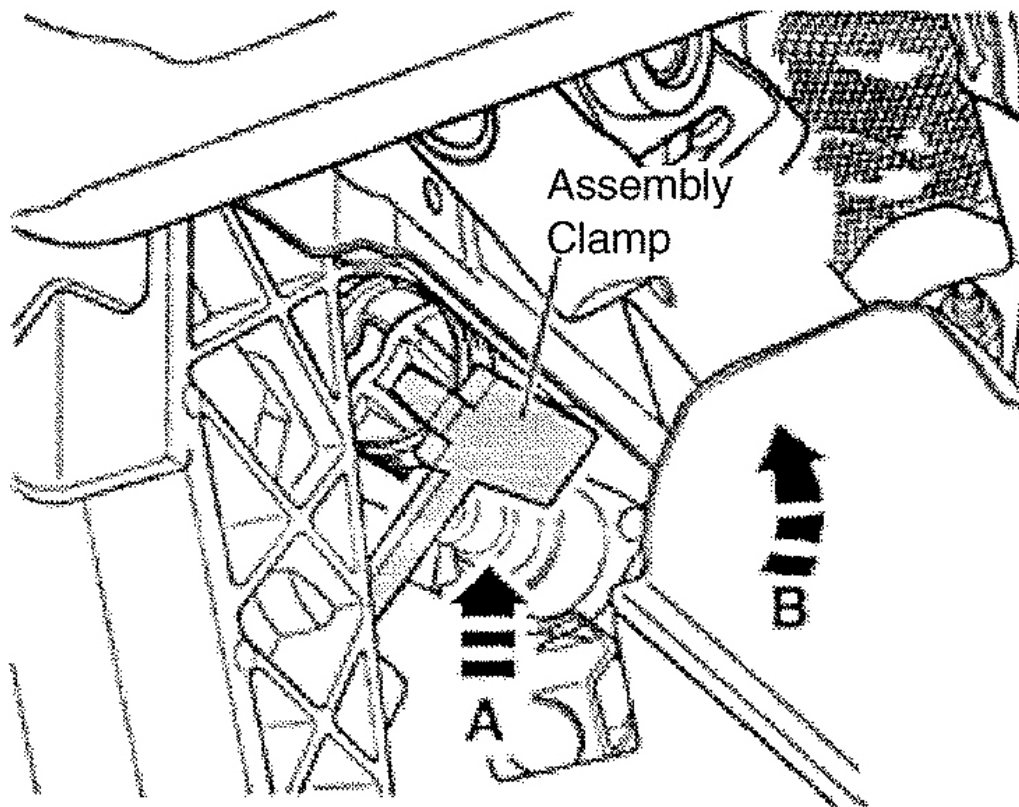
2. Press clutch pedal as far as possible toward bulkhead until overcenter spring can be removed downward out of mountings on bearing bracket and clutch pedal. Bring clutch pedal to rest position. Turn overcenter spring together with assembly clamp in direction of arrow (A) and take out downward in direction of arrow (B). See **Fig. 37** .



G00204299

Fig. 37: Turning Overcenter Spring & Clamp
Courtesy of VOLKSWAGEN UNITED STATES, INC.

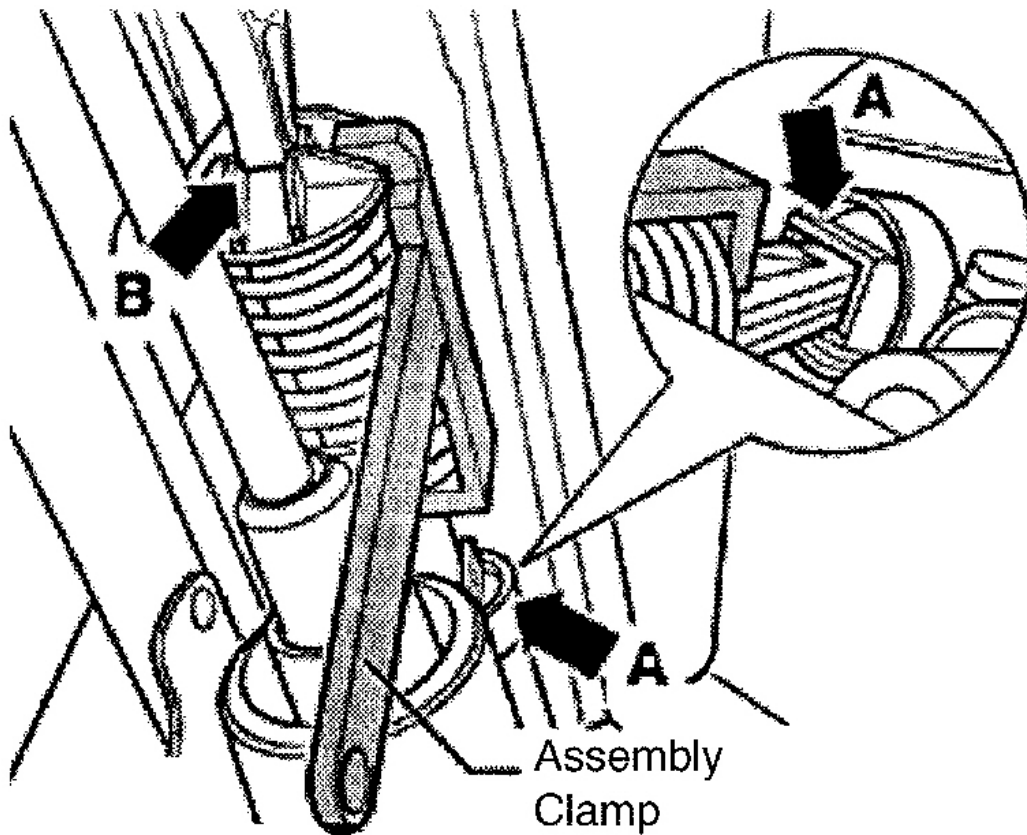
3. To install, pull clutch pedal into passenger compartment. Insert overcenter spring with assembly clamp (T10111) upward in direction of arrow (A) into bearing bracket, and then turn in direction of arrow (B). See **Fig. 38** .



G00204300

Fig. 38: Inserting Overcenter Spring Into Bearing Bracket
Courtesy of VOLKSWAGEN UNITED STATES, INC.

4. Insert overcenter spring into rear mounting first (A). See **Fig. 39** . Operate clutch pedal until overcenter spring seats on mounting tab (B) of clutch pedal. Remove assembly clamp while bringing clutch pedal to rest position. Install driver's side lower cover.



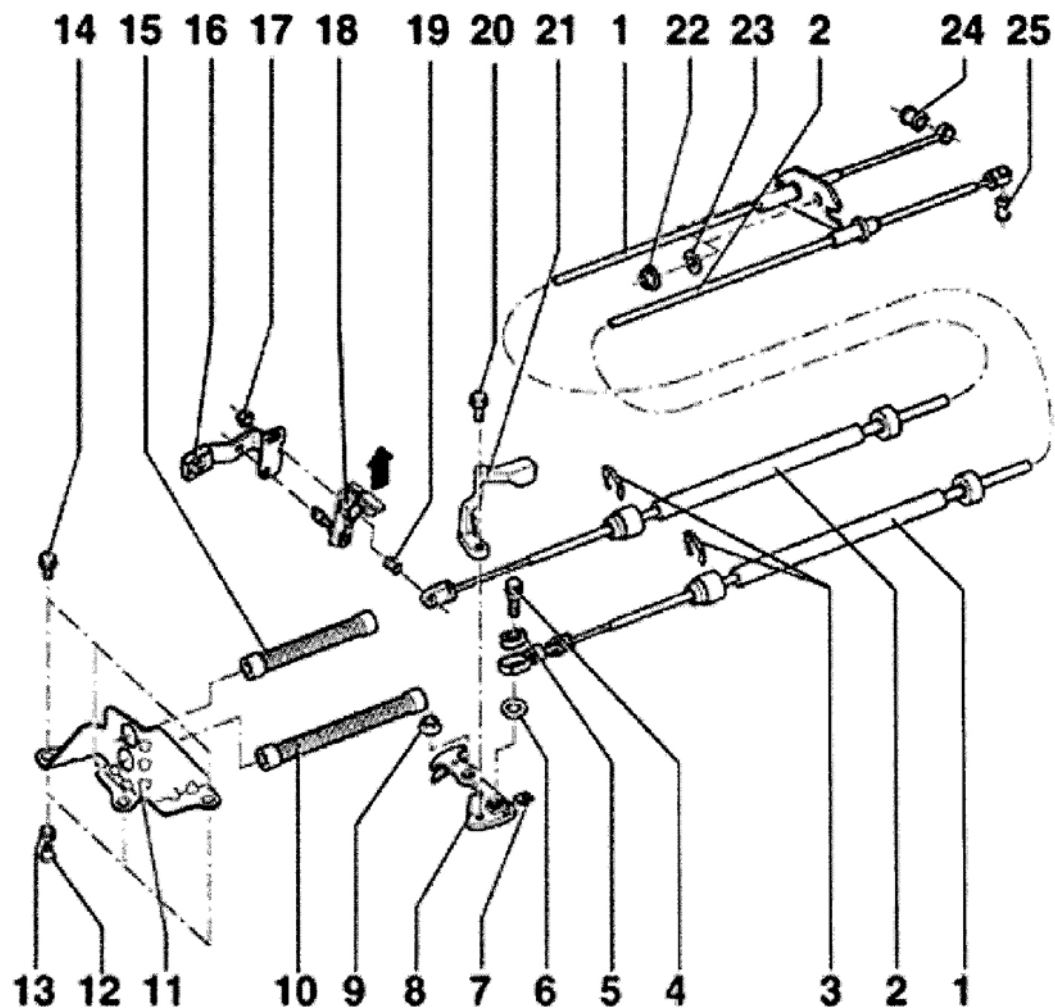
G00204301

Fig. 39: Inserting Overcenter Spring Into Rear Mounting
Courtesy of VOLKSWAGEN UNITED STATES, INC.

SELECTOR CABLES

Removal & Installation (Vehicles Built Up To May 1999)

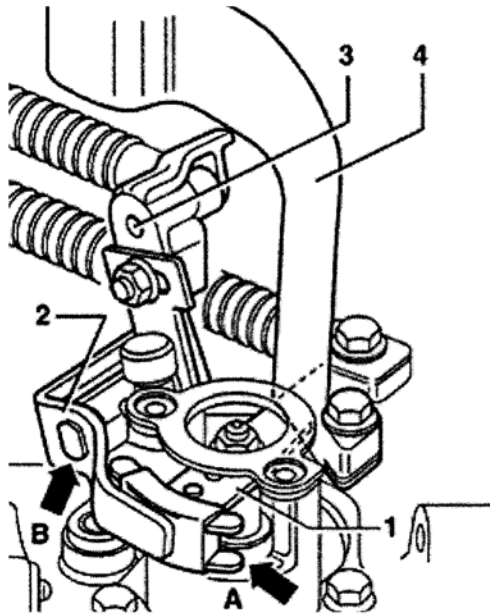
NOTE: Removal and installation information is not available from manufacturer. Use illustration as an aid for procedure. See Fig. 40 . Note the following points when servicing.



- | | |
|---|--|
| 1. Gear Selector Cable | 13. Bushing |
| 2. Gate Selector Cable | 14. Bolt |
| 3. Circlip | 15. Boot |
| 4. Gear Selector Combi-Bolt | 16. Relay Lever |
| 5. Rubber Bushing | 17. Self-Locking Nut |
| 6. Washer | 18. Actuating Arm |
| 7. Square Nut | 19. Rubber Bushing |
| 8. Gear Selector Lever | 20. Balance Weight Bolt |
| 9. Gear Selector Lever Self-Locking Nut | 21. Balance Weight |
| 10. Boot | 22. Self-Locking Nut |
| 11. Support Bracket | 23. Rubber Washer |
| 12. Distance Piece | 24. Gear Selector Cable Rubber Bushing |
| | 25. Gate Selector Cable Rubber Bushing |

Fig. 40: Exploded View Of Selector Cables (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Lubricate all mountings and sliding surfaces with Polyurea grease (G 052 142 A2). Relay lever (2) locates in guide rail of gear shift lever (arrow A). See **Fig. 41** . Lubricate with MoS2 grease. Actuating arm (3) flats (arrow B) of axis face mounting, relay lever only fits in one position. Balance weight (4) bolts on to gear selector lever.



1 - Gear selector lever

2 - Relay lever

Locates in guide rail of gear shift lever (arrow -A-)

Lubricate with MoS₂ grease

3 - Actuating arm

Flats (arrow -B-) of axis face mounting, relay lever only fits in one position

4 - Balance weight

Bolt on to gear selector lever

Note:

For ease of illustration the linkage and switch for reverse light have been removed.

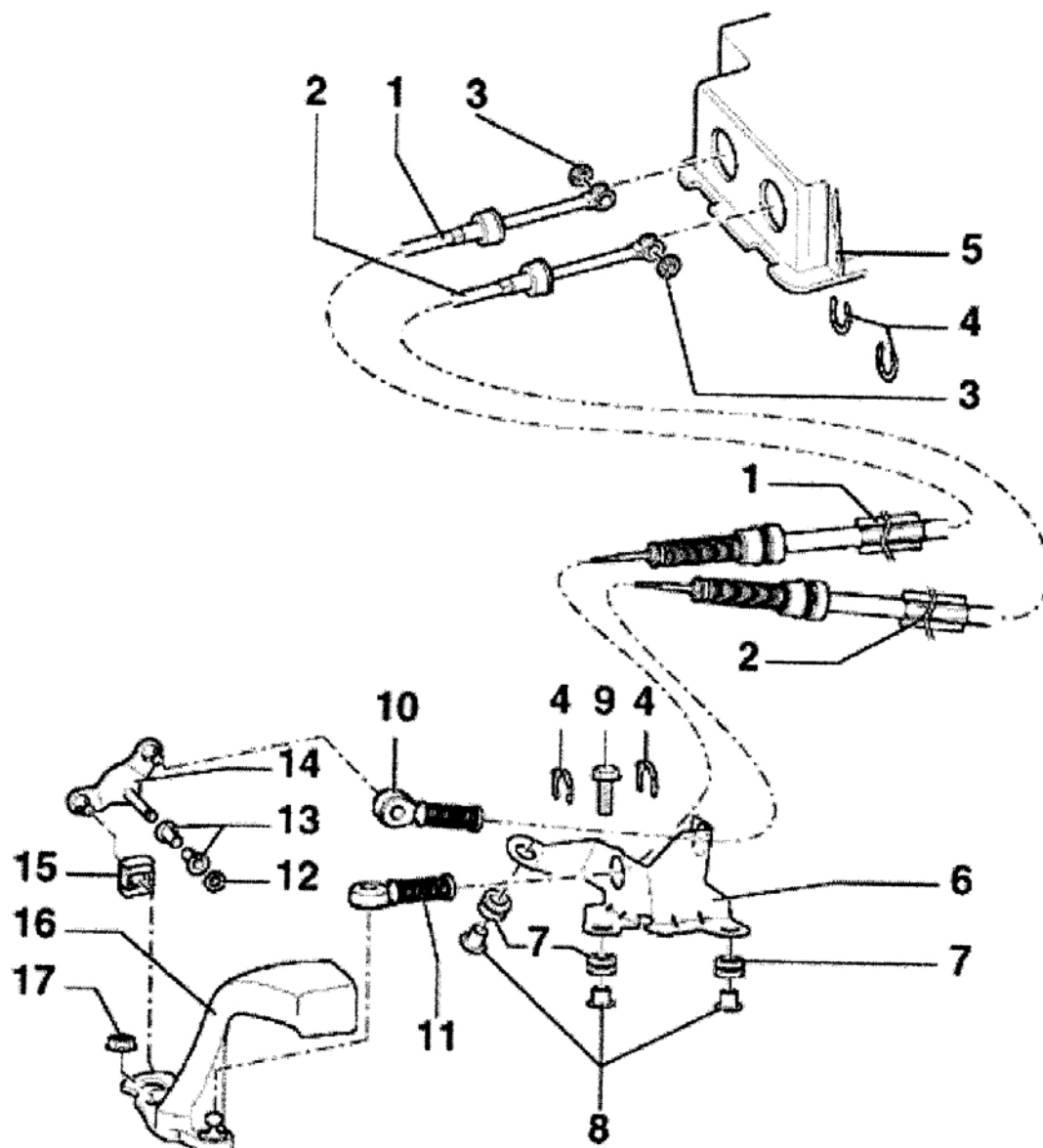
G00370038

Fig. 41: Installation Position Of Gear Selector Lever/Relay Lever (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Removal & Installation (Vehicles Built From June 1999)

NOTE:

Removal and installation information is not available from manufacturer. Use illustration as an aid for procedure. See Fig. 42 . Note the following points when servicing.



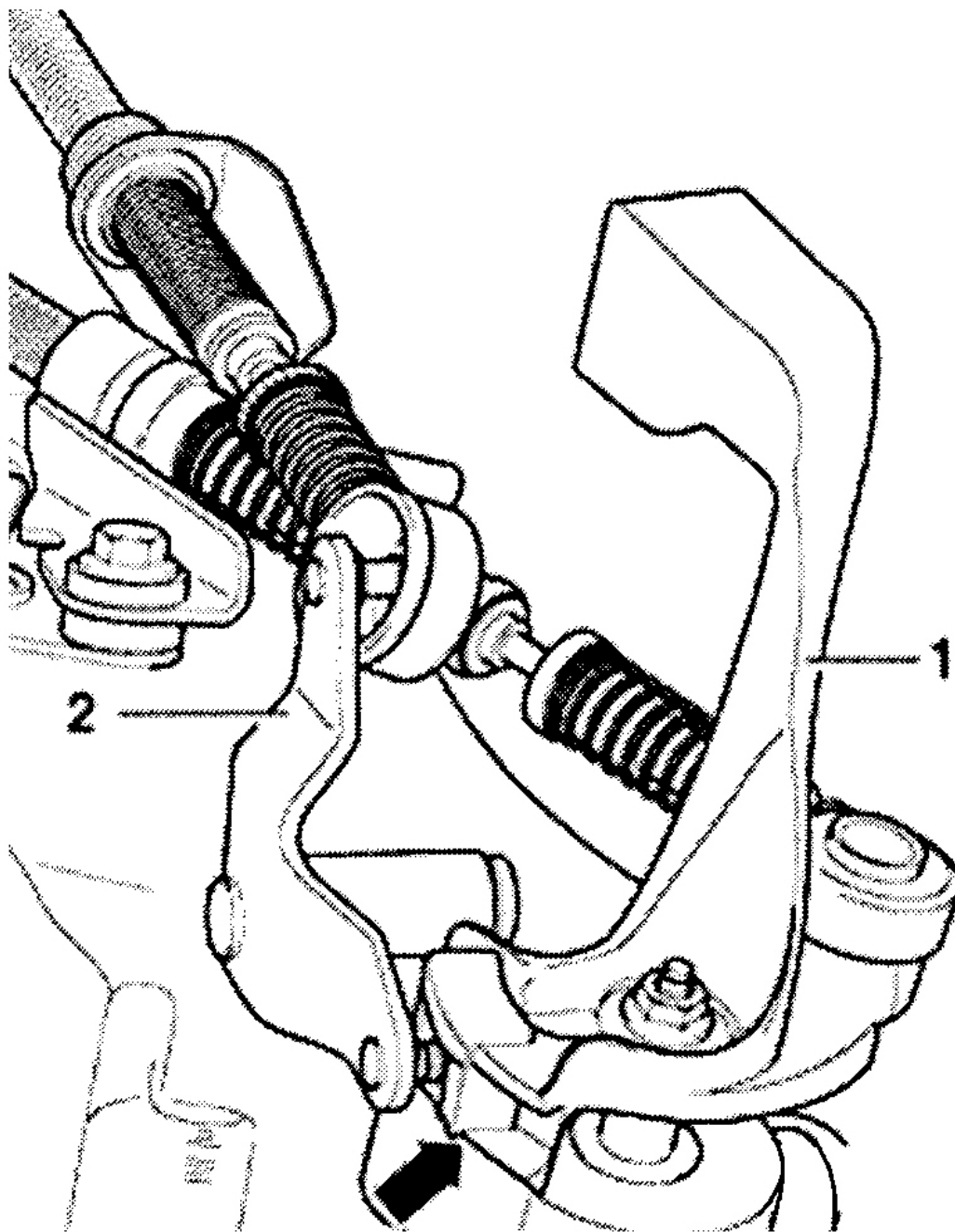
1. Gear Selector Cable
2. Gate Selector Cable
3. Circlip
4. Circlip
5. Selector Housing
6. Support Bracket
7. Support Bracket Mounting Bushing
8. Distance Piece
9. Support Bracket Bolt

10. Gate Selector Cable Locking Mechanism
11. Gate Selector Cable Locking Mechanism
12. Circlip
13. Bushing
14. Relay Lever
15. Shoe
16. Transmission Selector Lever
17. Transmission Selector Lever Nut

Fig. 42: Exploded View Of Selector Cables (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Lubricate all mountings and sliding surfaces with Polyurea grease (G 052 142 A2).

Relay lever (2) locates in guide rail of gear selector lever (1) via shoe (arrow). See **Fig. 43** .



G00374974

Fig. 43: Installation Position Of Transmission Selector Lever/Relay Lever (Vehicles Built From June 1999)

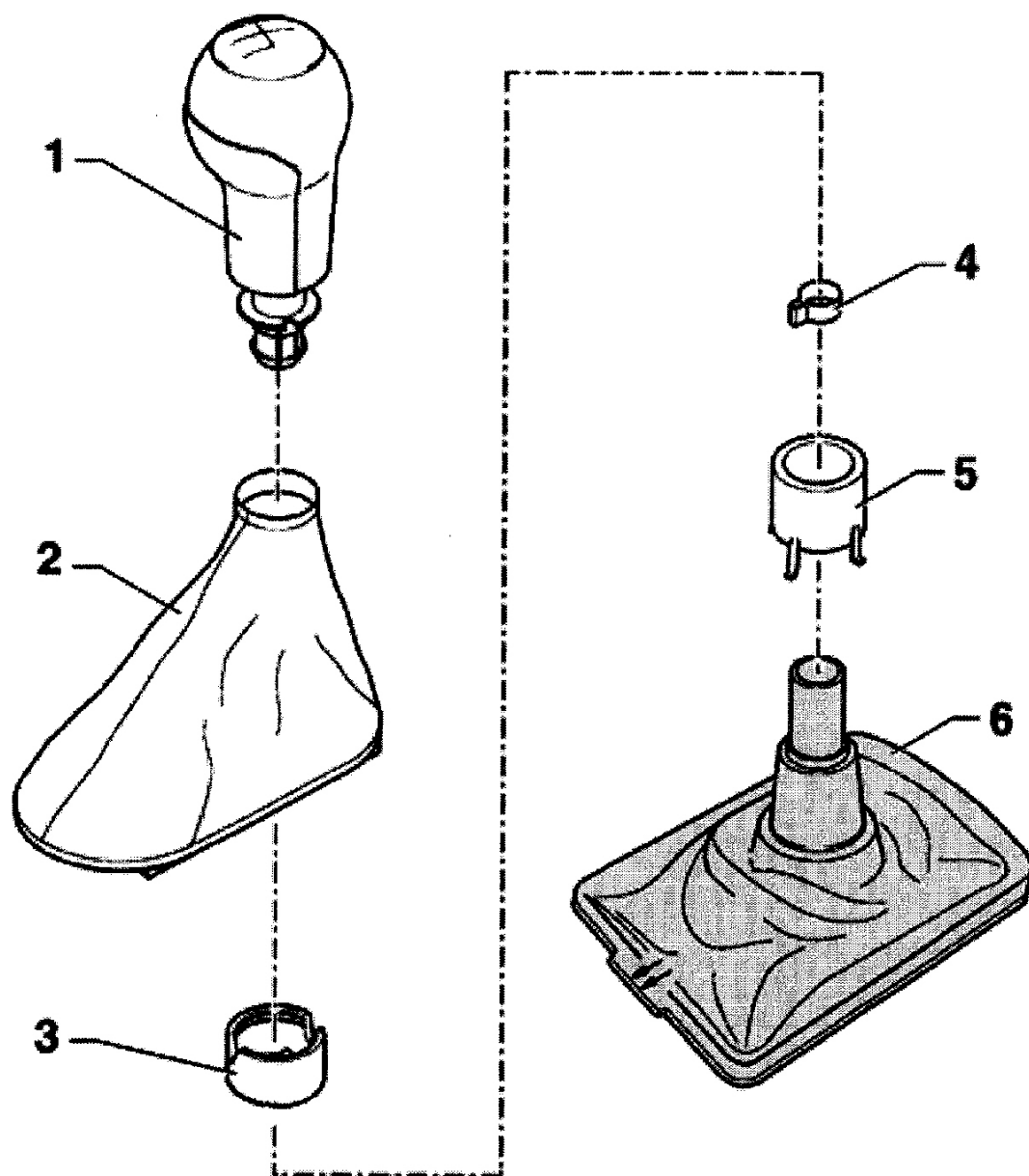
Courtesy of VOLKSWAGEN UNITED STATES, INC.

SELECTOR LEVER KNOB & BOOT

Removal & Installation (Vehicles Built From June 1999)

Use illustration as an aid for procedure. See **Fig. 44** . Note the following points when servicing.

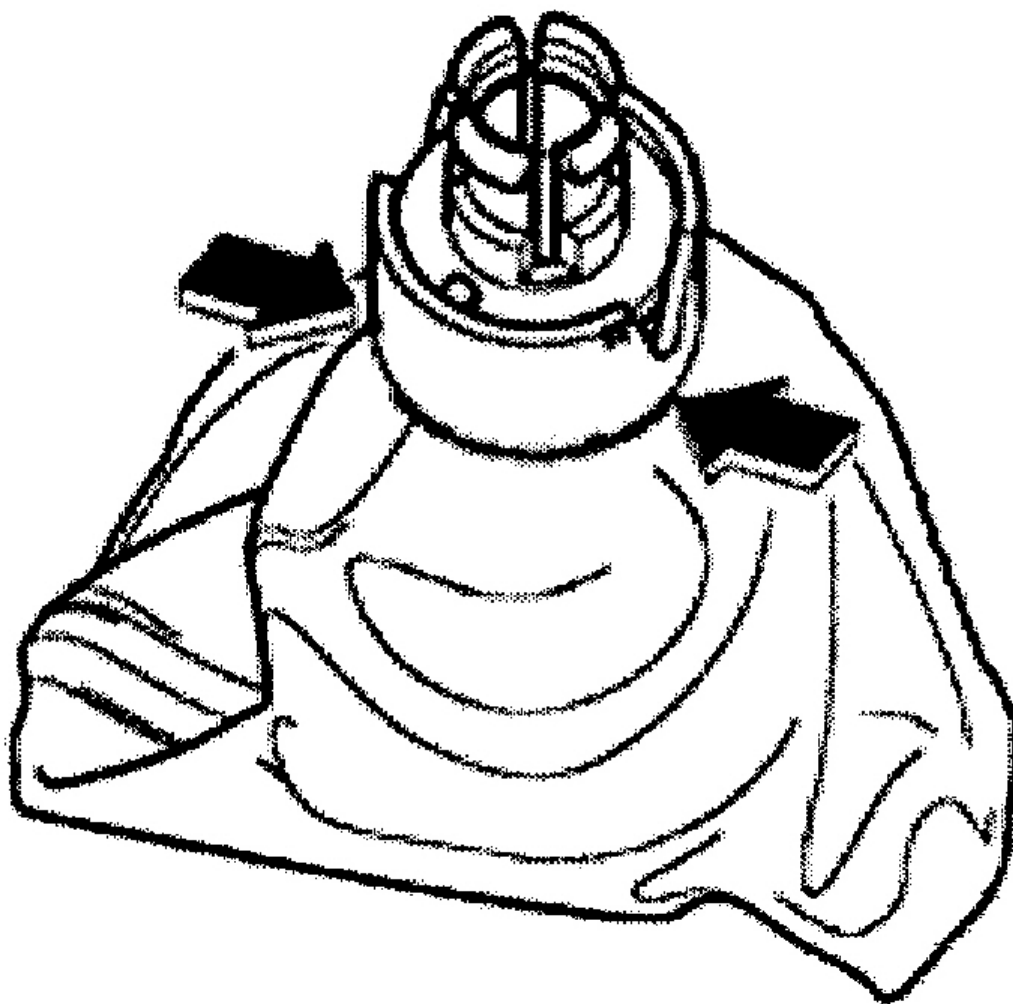
Selector lever knob screws on and off together with the boot. To separate and assemble cover to and from gear shift knob, turn boot inside out. Using a screwdriver, carefully pry clamping sleeve (arrow). See **Fig. 45** . Pull gear shift knob out.



1. Gear Lever Knob
2. Cover
3. Sleeve
4. Clamp
5. Bushing
6. Rubber Noise Damper

G00370096

Fig. 44: Exploded View Of Selector Lever Knob & Boot (Vehicles Built From June 1999)



G00370036

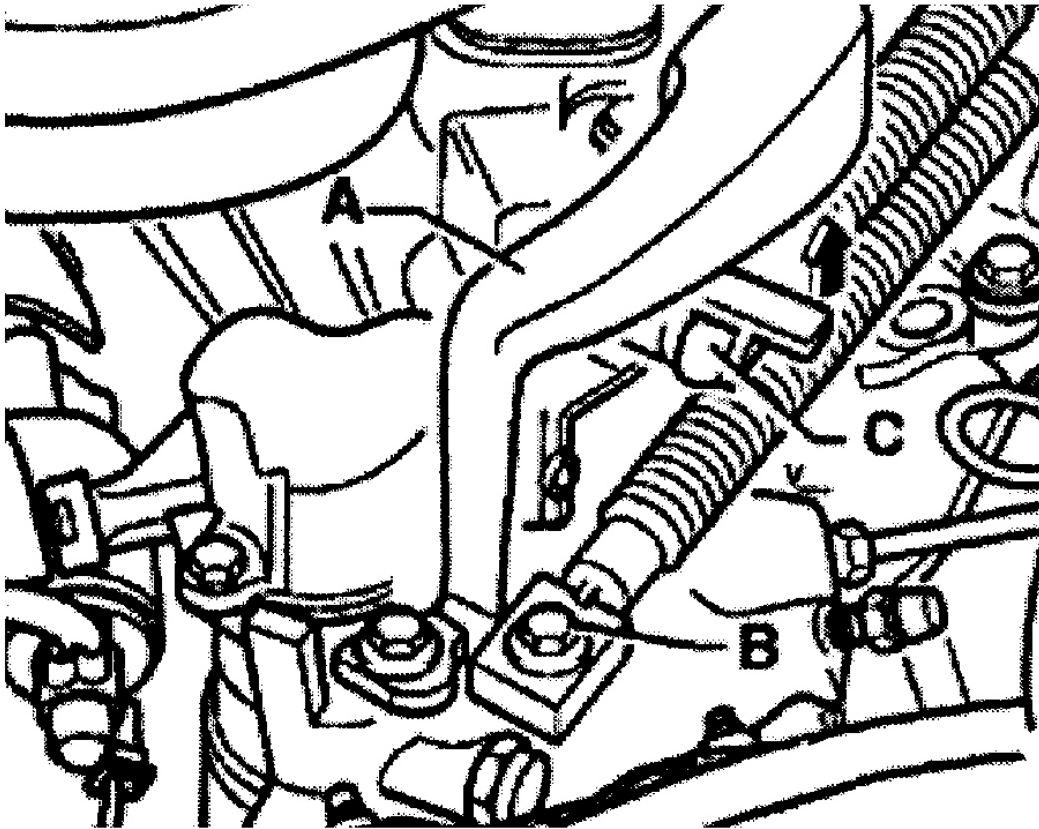
Fig. 45: Separating Cover From Gear Shift Knob (Vehicles From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

SELECTOR MECHANISM

Removal & Installation (Vehicles Built Up To May 1999)

1. Obtain radio code. Turn ignition switch to OFF position. Disconnect negative battery cable. See **BATTERY DISCONNECT PRECAUTIONS**.

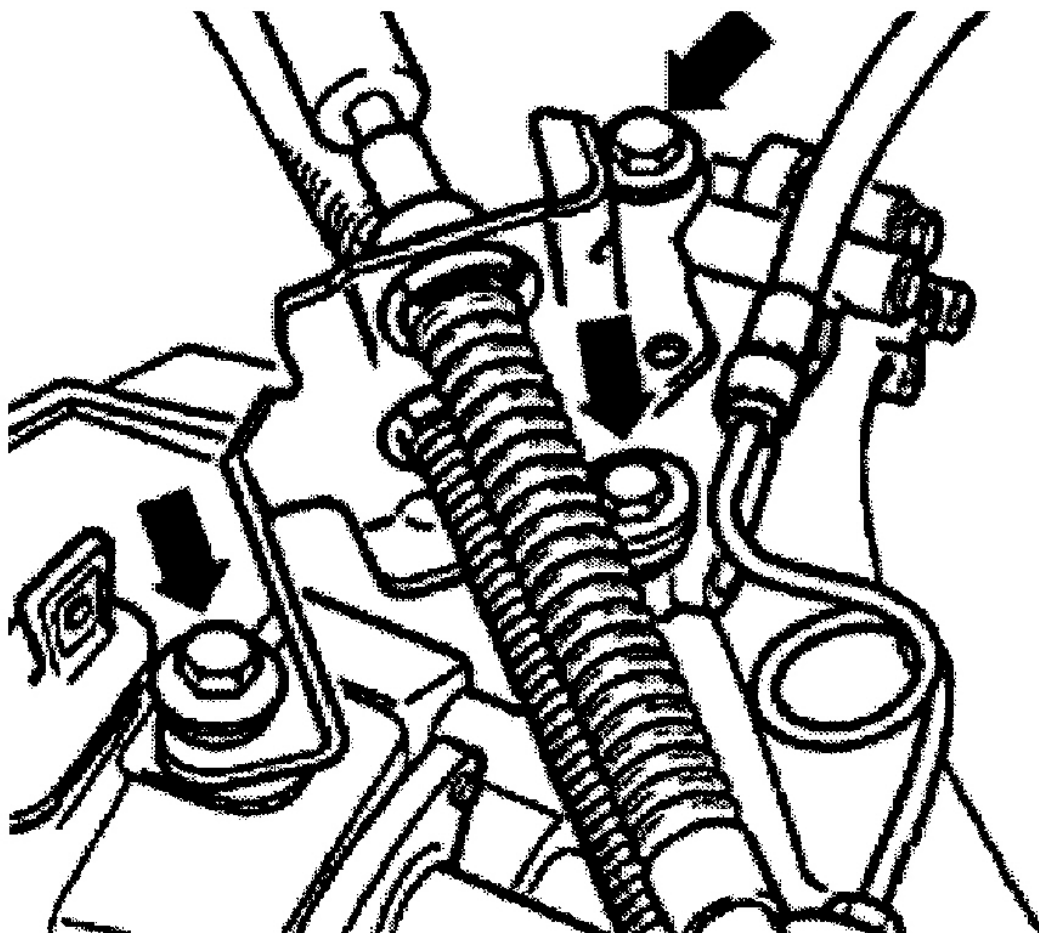
2. Remove intake hose (1) and connector (2) from mass air flow sensor. See **Fig. 9** .
3. Remove bolts (3, 4 and 5). Remove complete air cleaner assembly. Remove balance weight (A) and gear selector cable (B) from gear selector lever. See **Fig. 46** . Take off gear selector cable with washer and square nut (self-locking). Lift lug in direction of arrow, and pull gate selector cable off actuating arm/relay lever (C).



G00370039

Fig. 46: Removing Balance Weight & Gear Selector Cable (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

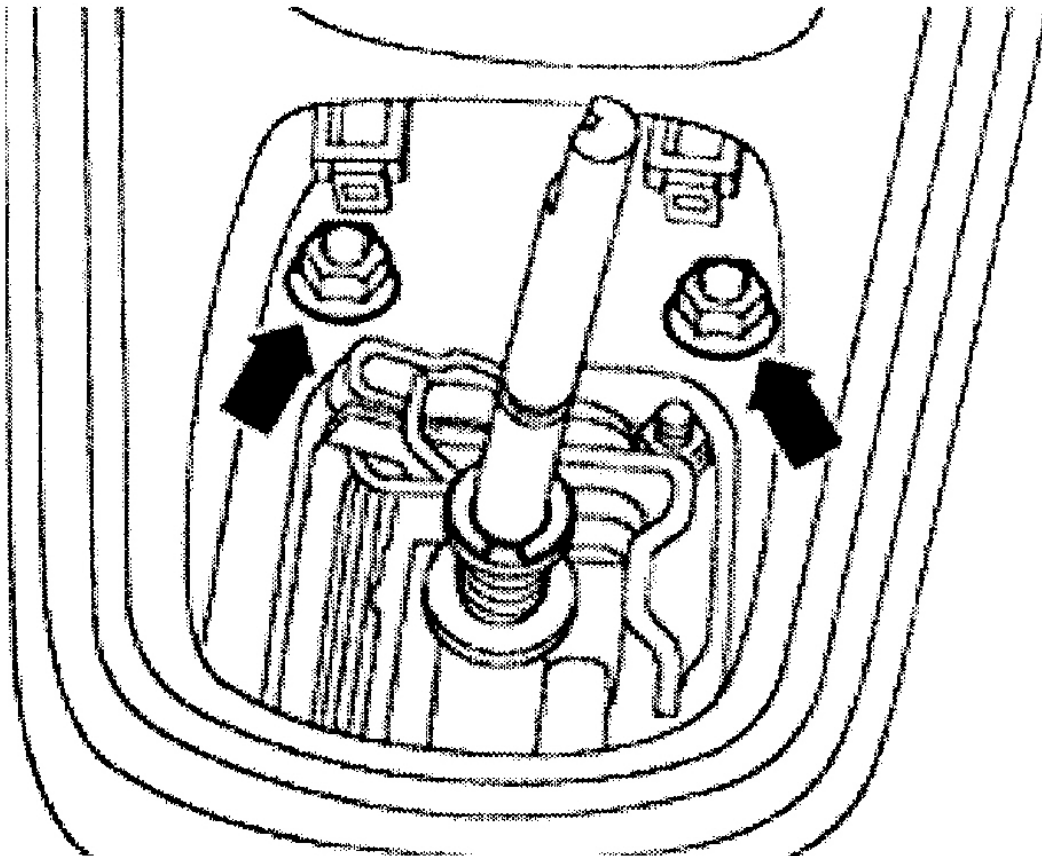
4. Remove cable support bracket from transmission (arrows). See **Fig. 47** . If necessary, unclip hose at cable support bracket first. Carefully lever cover off center console (arrows). See **Fig. 7** . Pull cover to rear off center console.



G00370040

Fig. 47: Removing Cable Support Bracket (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

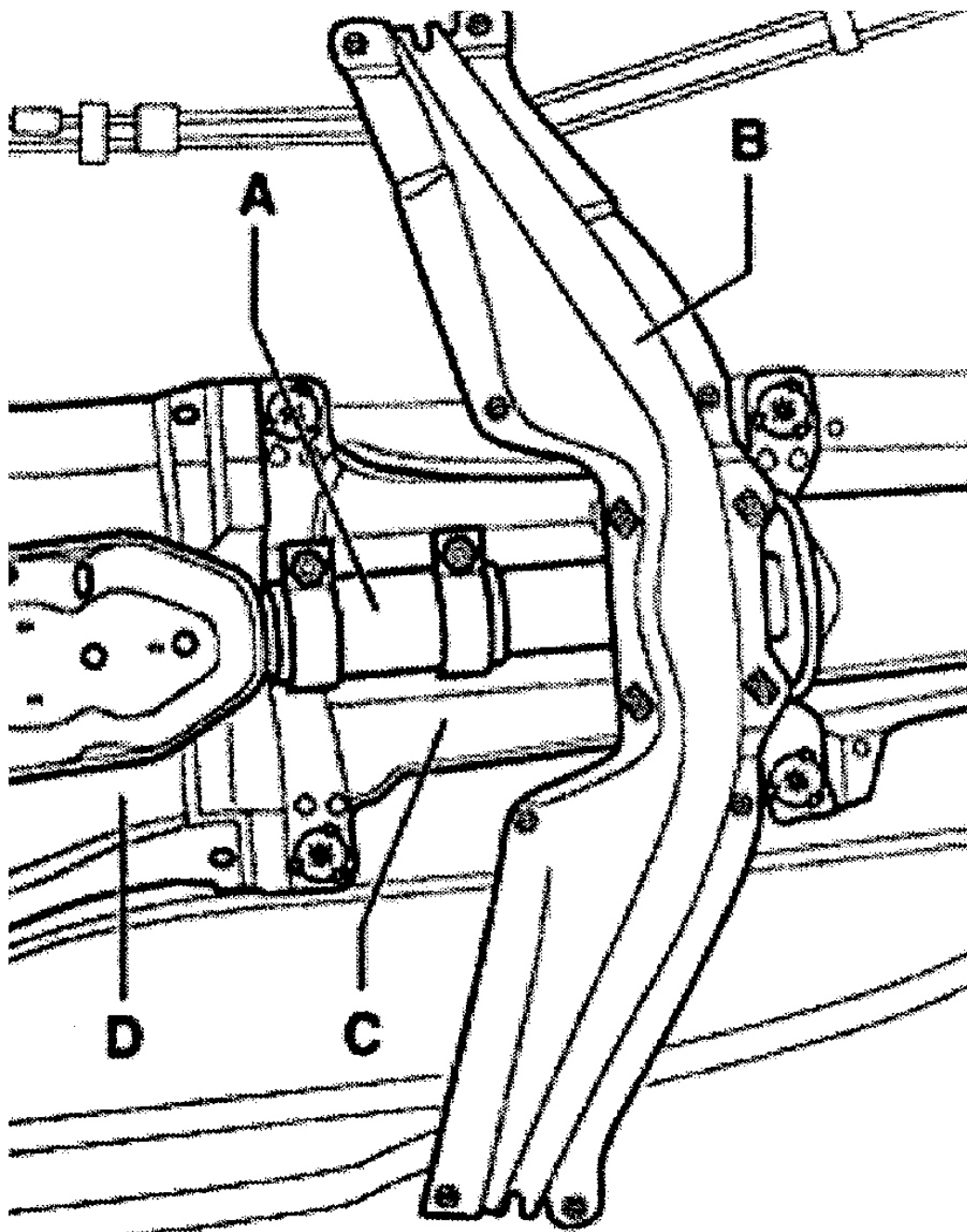
5. Destroy clip (arrow), and pull gear shift knob off with cover. See **Fig. 8** . Remove rubber cover, if equipped.
6. Remove gear lever housing securing nuts (arrows). See **Fig. 48** .



G00370041

Fig. 48: Removing Gear Lever Housing (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

7. Separate front exhaust pipe (A). See **Fig. 49** . Remove cross support (B) below exhaust system. Loosen heat shield (C), in forward area. Remove heat shield (D). Unbolt selector housing from body. Swing gear lever housing down, and remove with selector cables.



G00370042

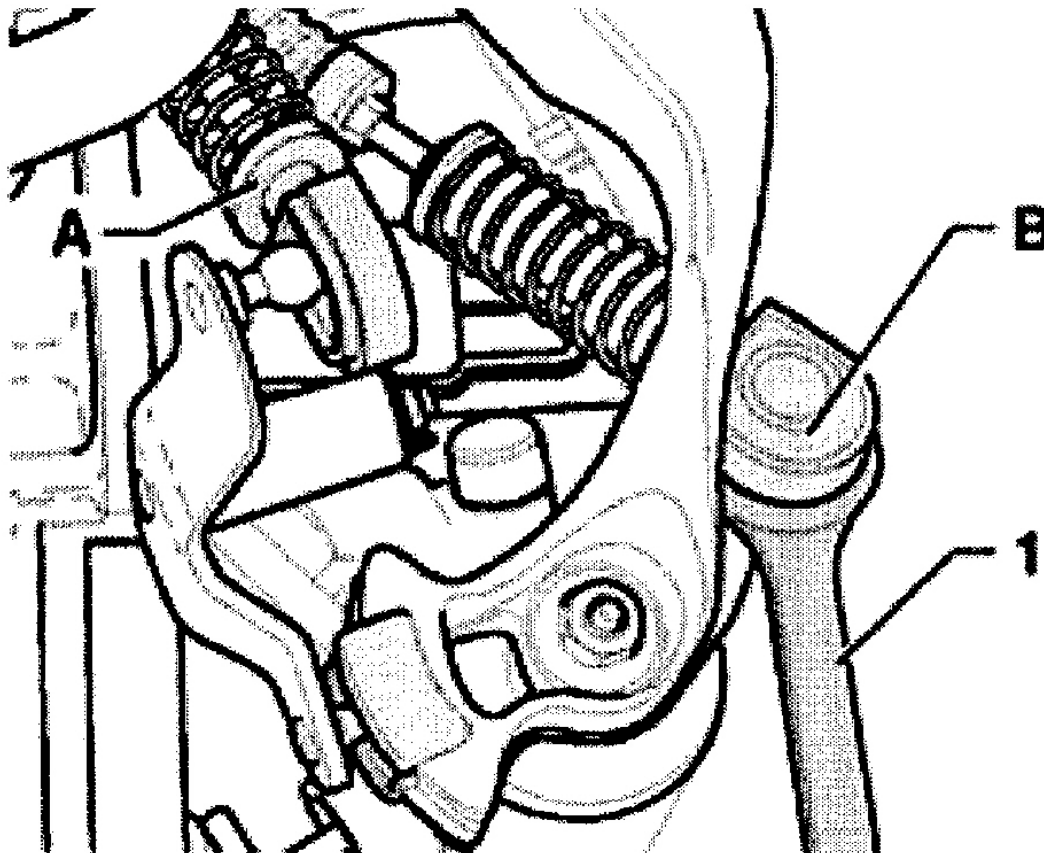
Fig. 49: Removing Cross Support (Vehicles Built Up To May 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

8. To install, reverse removal procedure. Align gear lever housing parallel to body. Distance to body must

be same on both sides. Adjust selector mechanism. See **SELECTOR MECHANISM** under **ADJUSTMENTS**. Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS**.

Removal & Installation (Vehicles Built From June 1999)

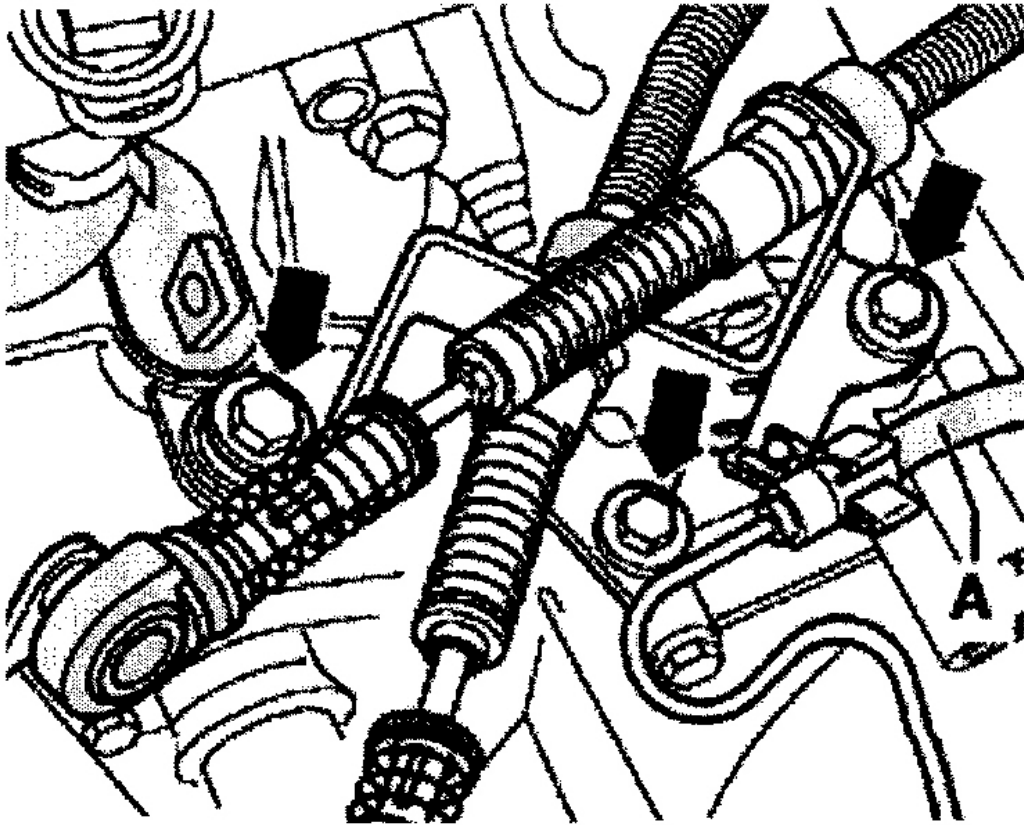
1. Obtain radio code. Turn ignition switch to OFF position. Disconnect negative battery cable. See **BATTERY DISCONNECT PRECAUTIONS**.
2. Remove intake hose (1) and connector (2) from mass air flow sensor. See **Fig. 9**. Using an open jaw spanner, pry gate selector cable (A) and gear selector cable (B) off transmission. See **Fig. 50**.



G00370043

Fig. 50: Removing Gate & Gear Selector Cables (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

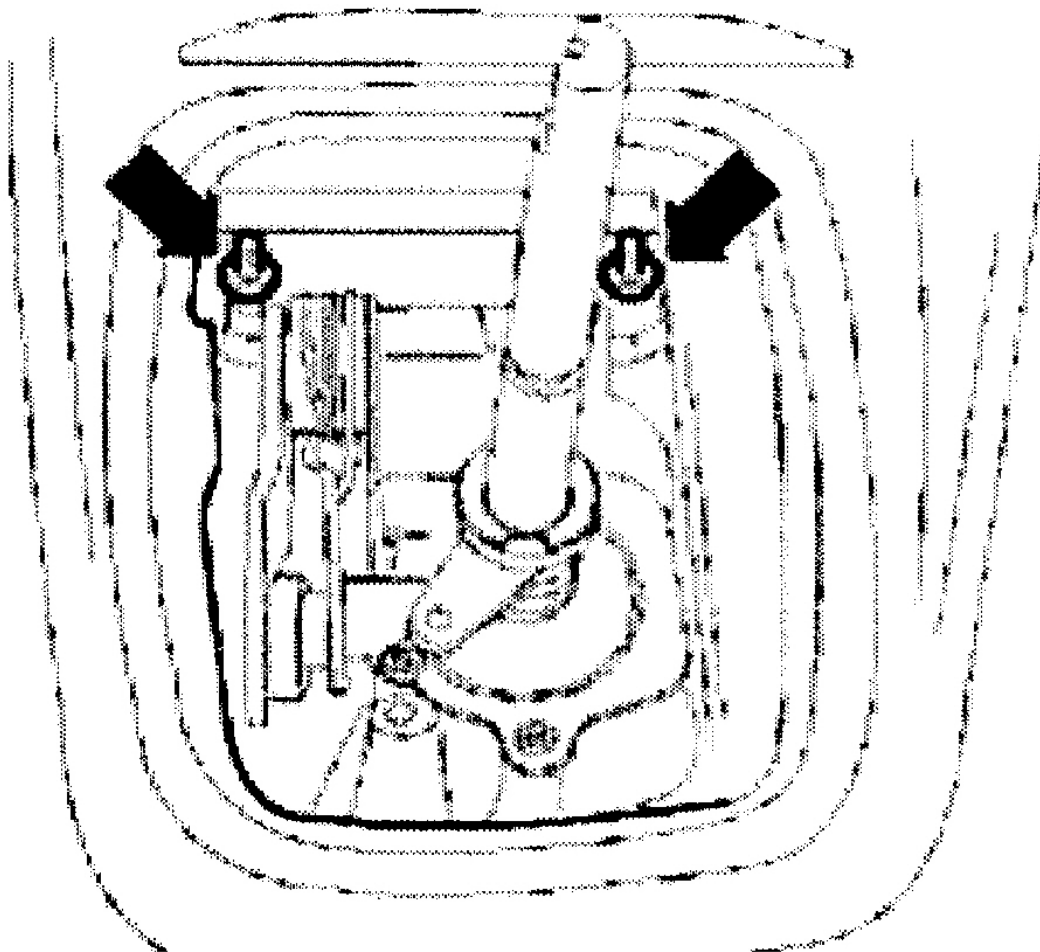
3. Remove cable support bracket from transmission (arrows). See **Fig. 51**. If necessary, unclip hose at cable support bracket first. Carefully pry cover off center console (arrows). See **Fig. 7**. Pull cover to rear off center console.



G00370097

Fig. 51: Removing Cable Support Bracket (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

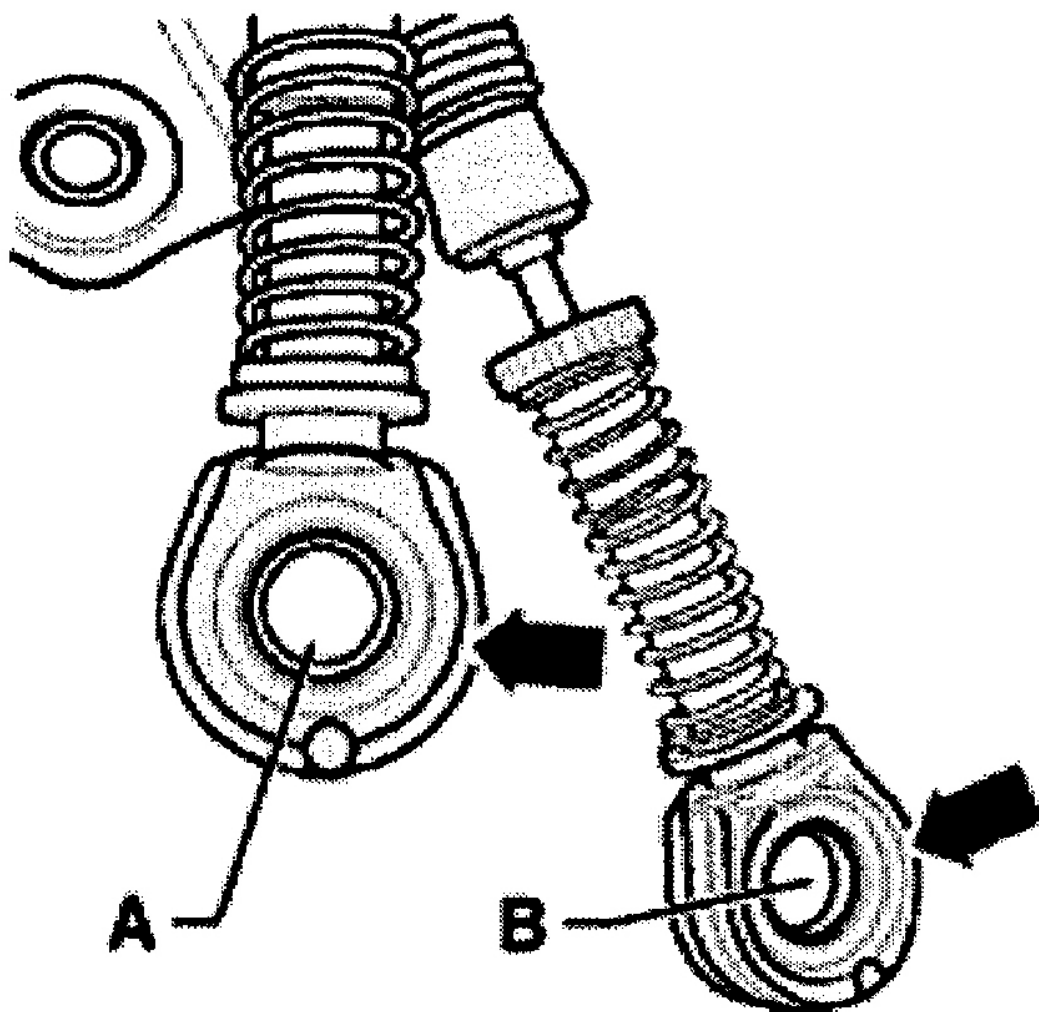
4. Destroy clip (arrow), and pull gear shift knob off with cover. See **Fig. 8** . Remove rubber cover, if equipped.
5. Remove gear lever housing front securing nuts (arrows). See **Fig. 52** .



G00370046

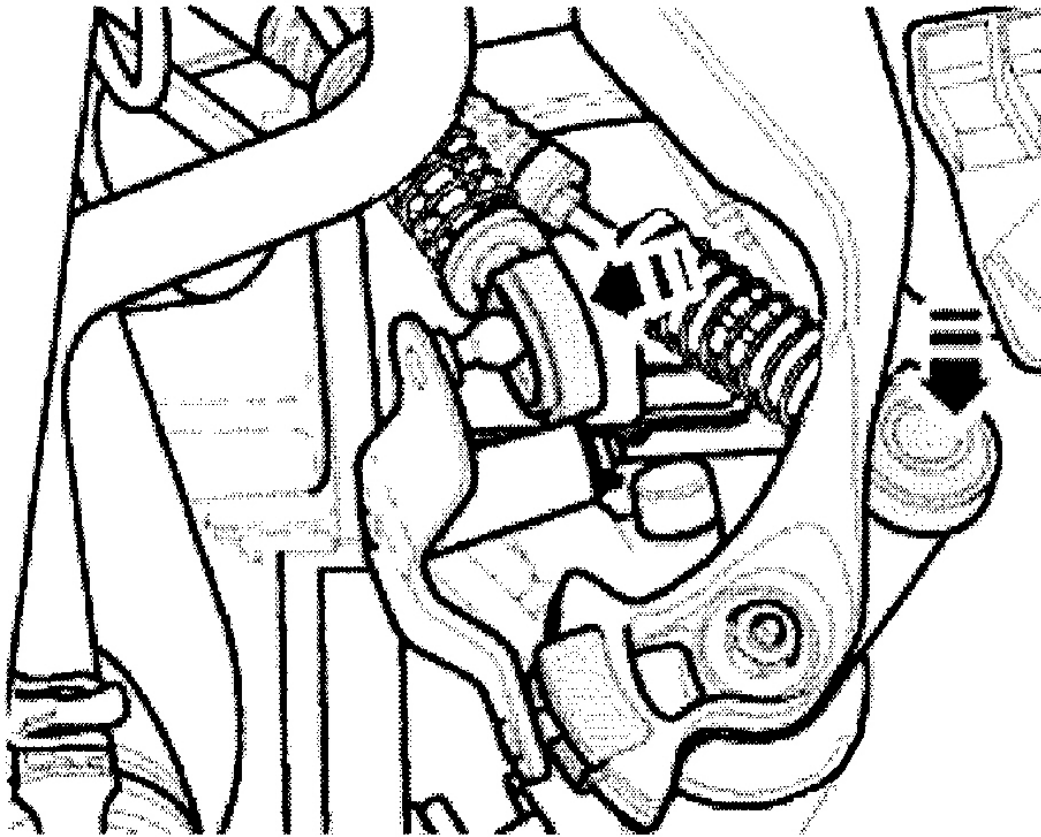
Fig. 52: Removing Front Gear Lever Housing Securing Nuts (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

6. Separate front exhaust pipe (A). See **Fig. 49** . Remove cross support (B) below exhaust system. Loosen heat shield (C), in forward area. Remove heat shield (D). Unbolt selector housing from body. Swing gear lever housing down, and remove with selector cables.
7. To install, reverse removal procedure. Smear a small amount of Polyurea grease in recesses of cable locking mechanism (A) and gate cable locking mechanism (B). See **Fig. 53** . Seals (arrows) outside recess must be grease free. Press selector cable onto transmission selector lever and gate selector cable onto relay lever (arrows). See **Fig. 54** .



G00370047

Fig. 53: Installing Cable & Gate Cable Locking Mechanisms (Vehicles Built From June 1999)
Courtesy of VOLKSWAGEN UNITED STATES, INC.



G00370048

Fig. 54: Installing Gear Selector Cable-To-Transmission Selector Lever (Vehicles Built From June 1999)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

8. Adjust selector mechanism. See **SELECTOR MECHANISM** under ADJUSTMENTS.

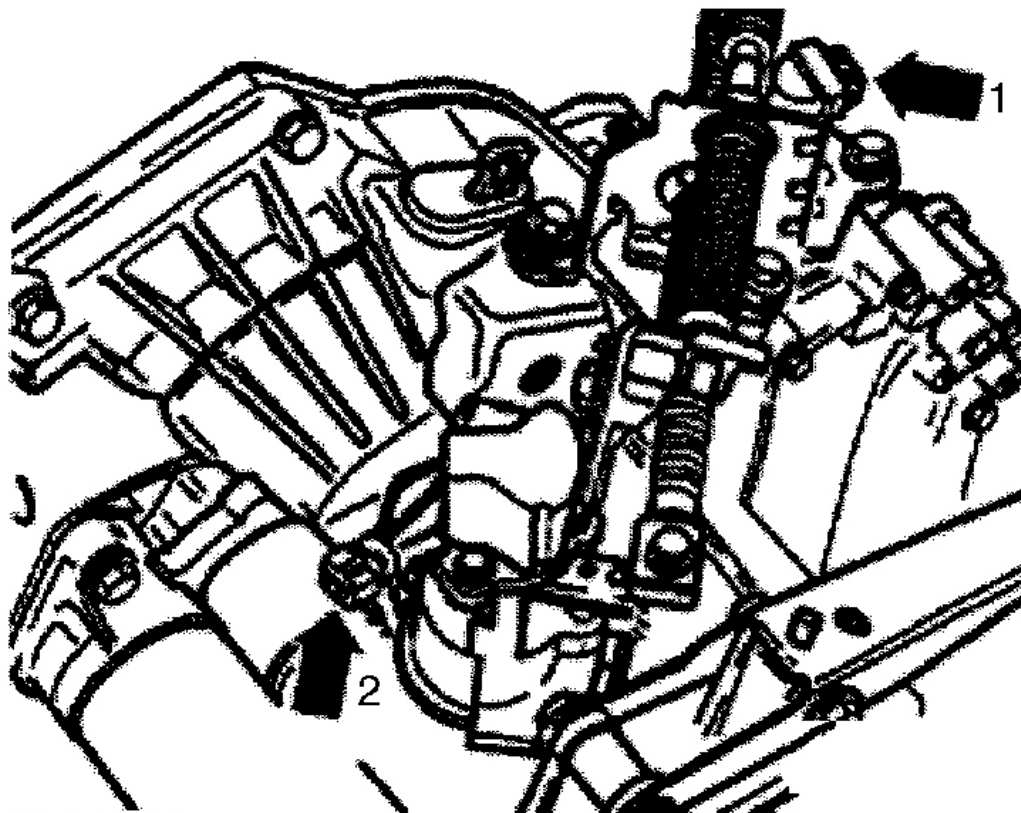
TRANSMISSION

Removal

1. Remove engine cover. Obtain radio code. Turn ignition switch to OFF position. Disconnect negative battery cable. See **BATTERY DISCONNECT PRECAUTIONS**.
2. Remove power steering reservoir from battery carrier. DO NOT open/loosen hoses. Wire reservoir to lock carrier. Remove battery and battery carrier.
3. Remove intake hose (1), connector (2) and vacuum hose (3) from mass air flow sensor. See **Fig. 9**. Remove complete air cleaner assembly housing by removing bolts (4 and 5).
- 4.

NOTE: On vehicles built, FROM June 1999, go to step 7 .

On vehicles built up to May 1999, disconnect reverse light harness connector (arrow 2). See **Fig. 55** . Pull connector off vehicle speed sensor (arrow 1). Disconnect vehicle speed sensor (arrow 1) and back-up light switch (arrow 2) harness connectors.



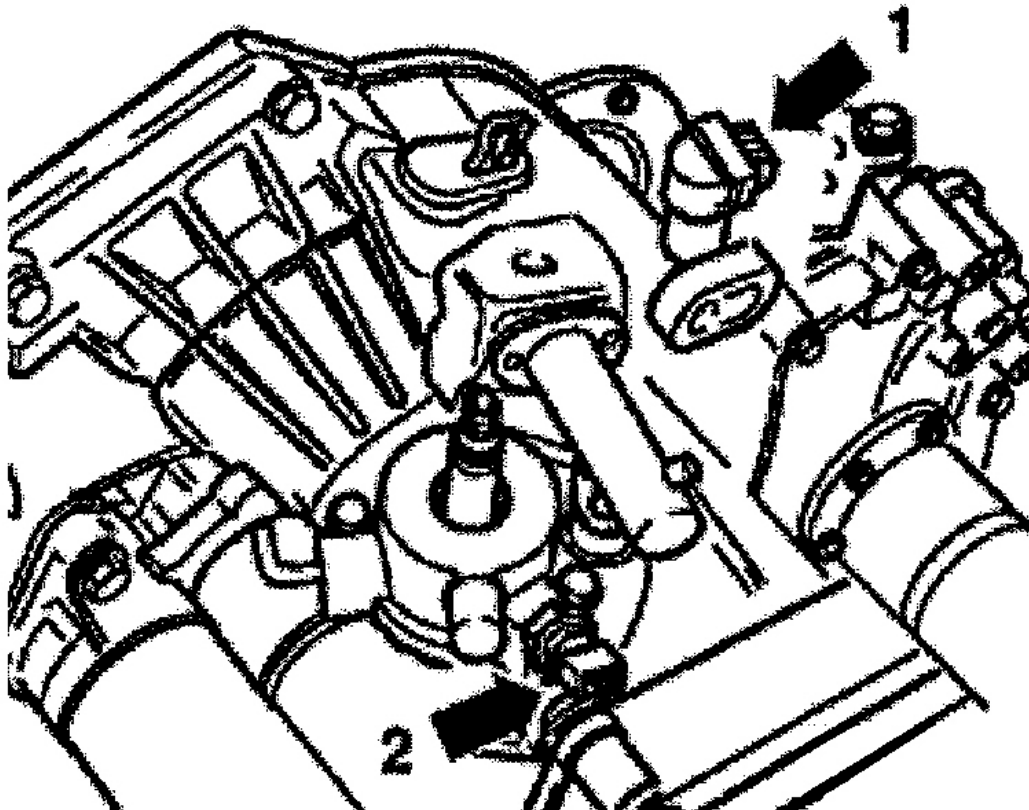
G00370098

Fig. 55: Disconnect Speed Sensor & Back-Up Light Connectors
Courtesy of VOLKSWAGEN UNITED STATES, INC.

5. Remove balance weight (A) and gear selector cable (B) from gear selector lever. See **Fig. 46** . Remove gear selector cable with washer and square nut (self-locking). Lift tab in direction of arrow, and pull gate selector cable off actuating arm/relay lever (C).
6. Remove cable support bracket from transmission (arrows). See **Fig. 47** . If necessary, unclip hose at cable support bracket first.

NOTE: Continue transmission removal procedure at step 10 .

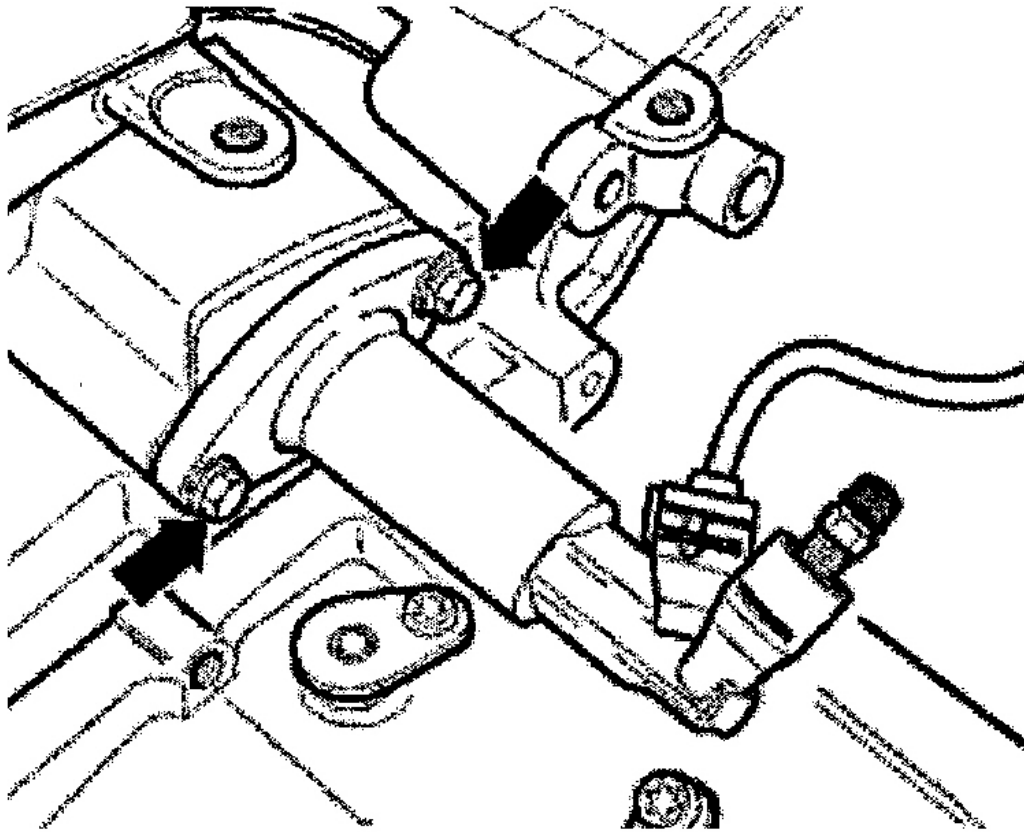
7. On vehicles built from June 1999, remove cable support bracket from transmission (arrows), if necessary unclip hose (A) at cable support bracket first. See **Fig. 51** .
8. Remove circlip and pull off gate selector cable (A) with relay lever. See **Fig. 71** . Remove nut (arrow) and remove gear selector cable (B) with transmission selector lever. Tie selector cable with transmission selector lever and gate selector cable with relay lever up.
9. Disconnect vehicle speed sensor (arrow 1) and reverse light switch (arrow 2) harness connectors. See **Fig. 56** .



G00204350

Fig. 56: Disconnecting Speed Sensor & Back-Up Light Switch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

10. On all models, remove slave cylinder, and wire aside. See **Fig. 57** . DO NOT disconnect lines. DO NOT depress clutch pedal.



G00204347

Fig. 57: Removing Slave Cylinder

Courtesy of VOLKSWAGEN UNITED STATES, INC.

11. Remove cable retainer (arrow 1) on starter. See **Fig. 58** . Remove upper securing bolt (arrow 2) on starter. Remove ground strap at engine/transmission upper securing bolt. Remove engine/transmission upper securing bolts.

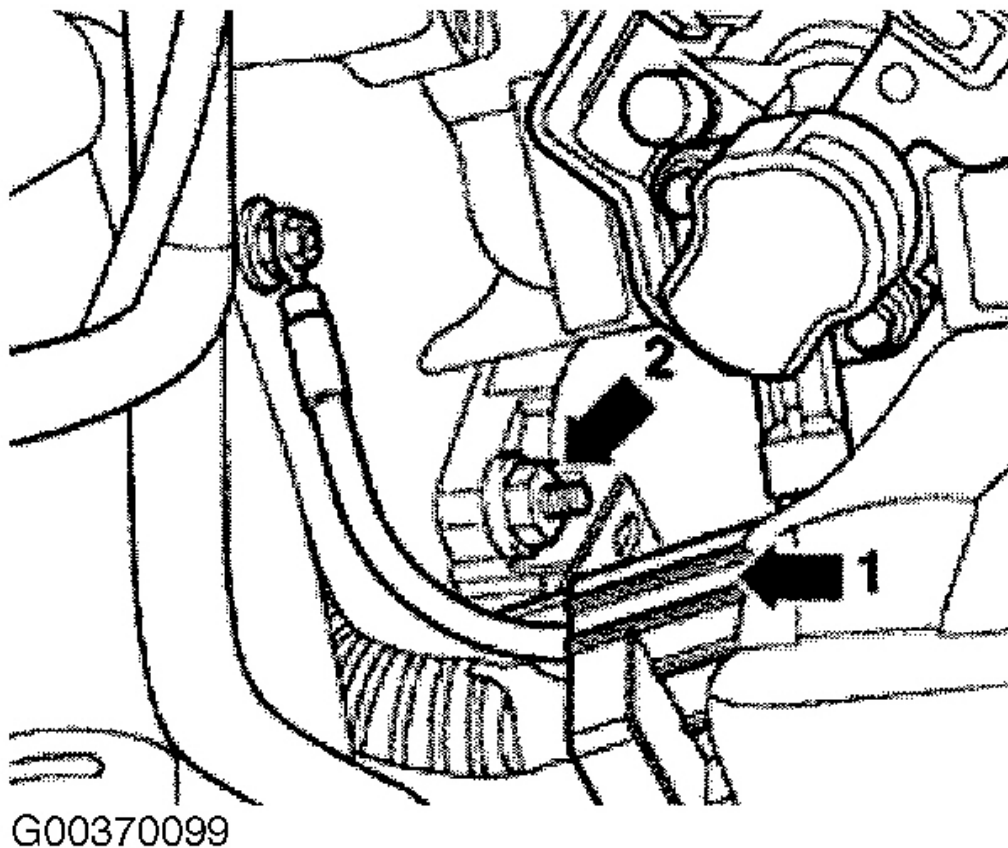


Fig. 58: Removing Cable Retainer & Upper Securing Bolt
Courtesy of VOLKSWAGEN UNITED STATES, INC.

12. If there are hoses and cable connections in area of engine mounting eye, these will need to be removed, so support (10-222A) can be attached to mounting eye. Erect support device (10-222A) with adapters (10-222 A/8). See **Fig. 59** . DO NOT seat adapters (10-222 A/8) on securing bolts for front end fender. Take weight of engine/transmission assembly on spindles. Remove noise insulation tray.

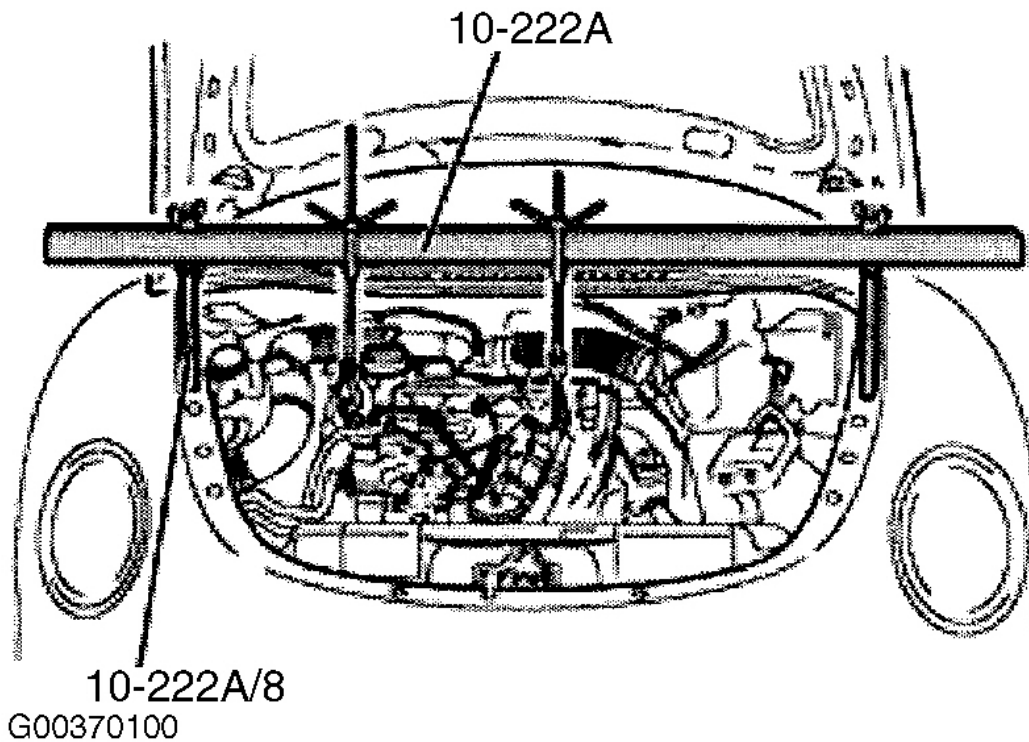
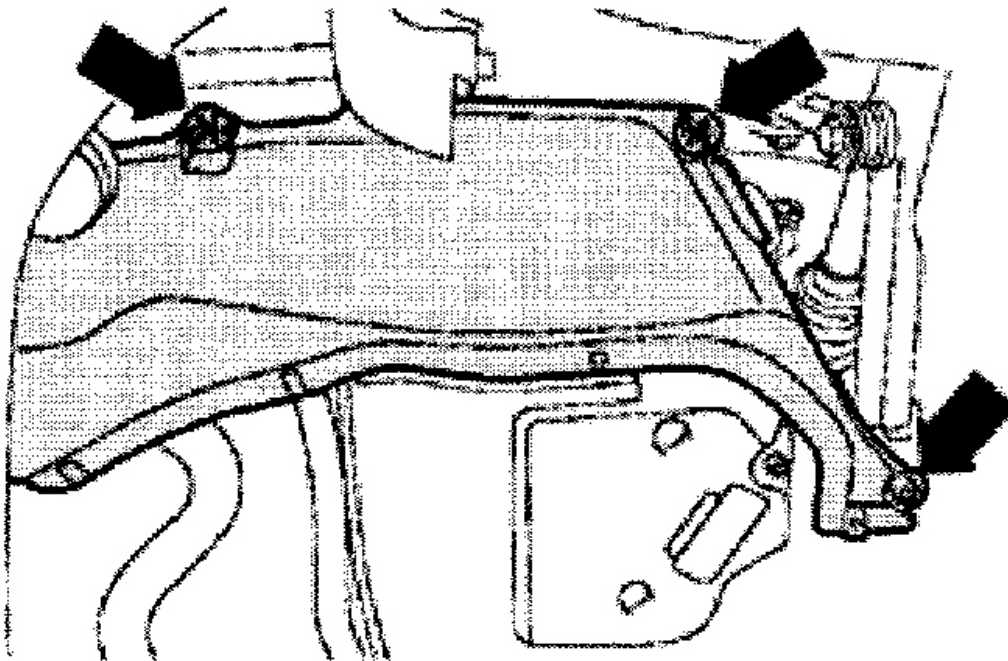


Fig. 59: Installing Support (10-222A) & Adapters (10-222 A/8)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

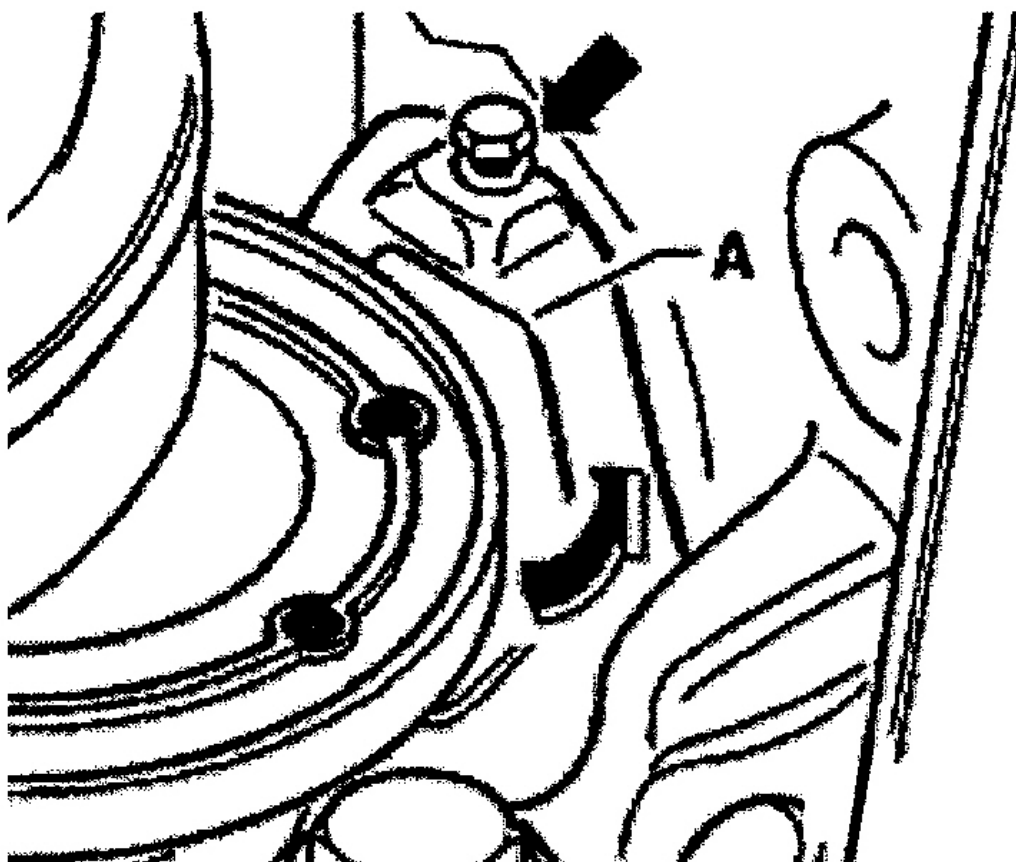
13. Remove left noise insulation panel (arrows). See **Fig. 60** . Remove power steering line from starter and transmission. Remove starter.



G00370101

Fig. 60: Identifying Left Noise Insulation Mounting Points
Courtesy of VOLKSWAGEN UNITED STATES, INC.

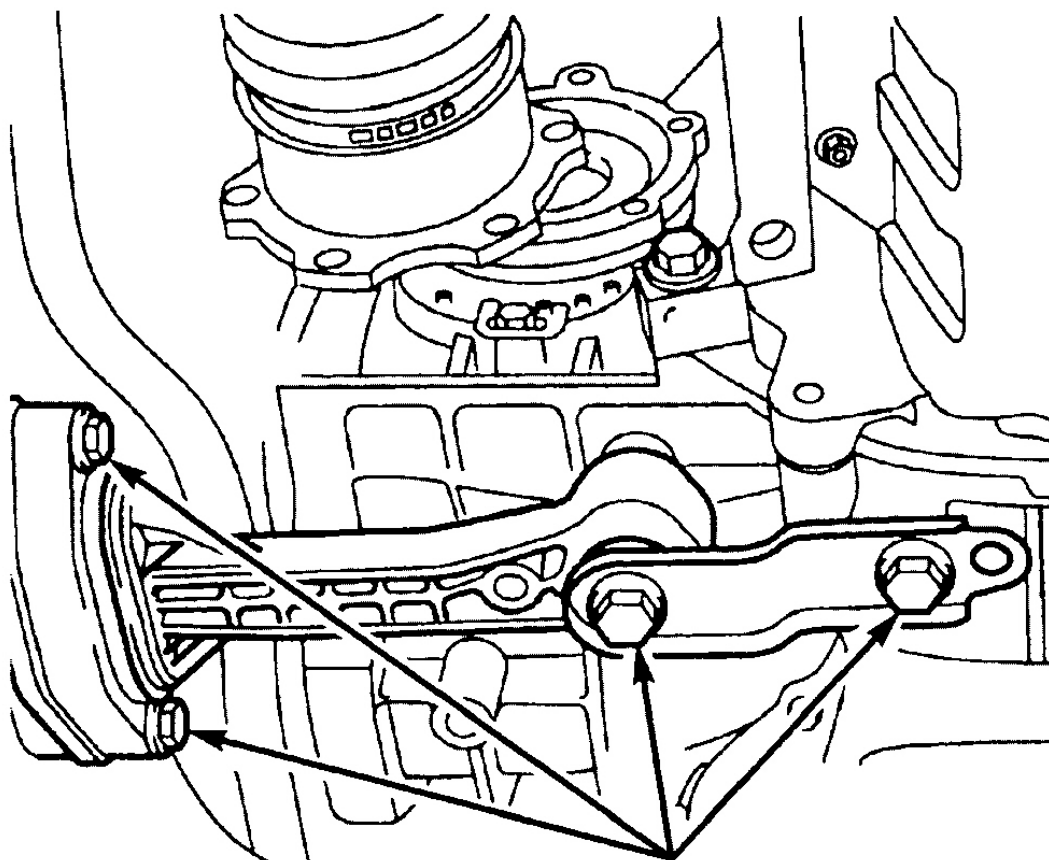
14. Remove right-hand inner constant velocity joint protective cover from engine, if equipped. Turn wheels fully onto left lock. Disconnect drive axle shafts from transmission flange, and wire up as high as possible. Ensure to NOT damage surface protection of axle shafts.
15. Remove flywheel small over plate (A) behind right-hand flanged shaft (arrows), if equipped. See **Fig. 61** . Disconnect exhaust system, after front exhaust line at double clamp (A). Remove front exhaust line supports from subframe, if necessary.



G00204351

Fig. 61: Removing Small Cover Plate (If Equipped)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

16. Remove pendulum support bolts (arrows). See **Fig. 62** . Remove transmission support (arrows) from transmission. See **Fig. 63** . Remove bolts from left-hand assembly mounting (arrows).



**Pendulum Support
Bolts**

G98D12990

Fig. 62: Identifying Pendulum Support Mounting Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

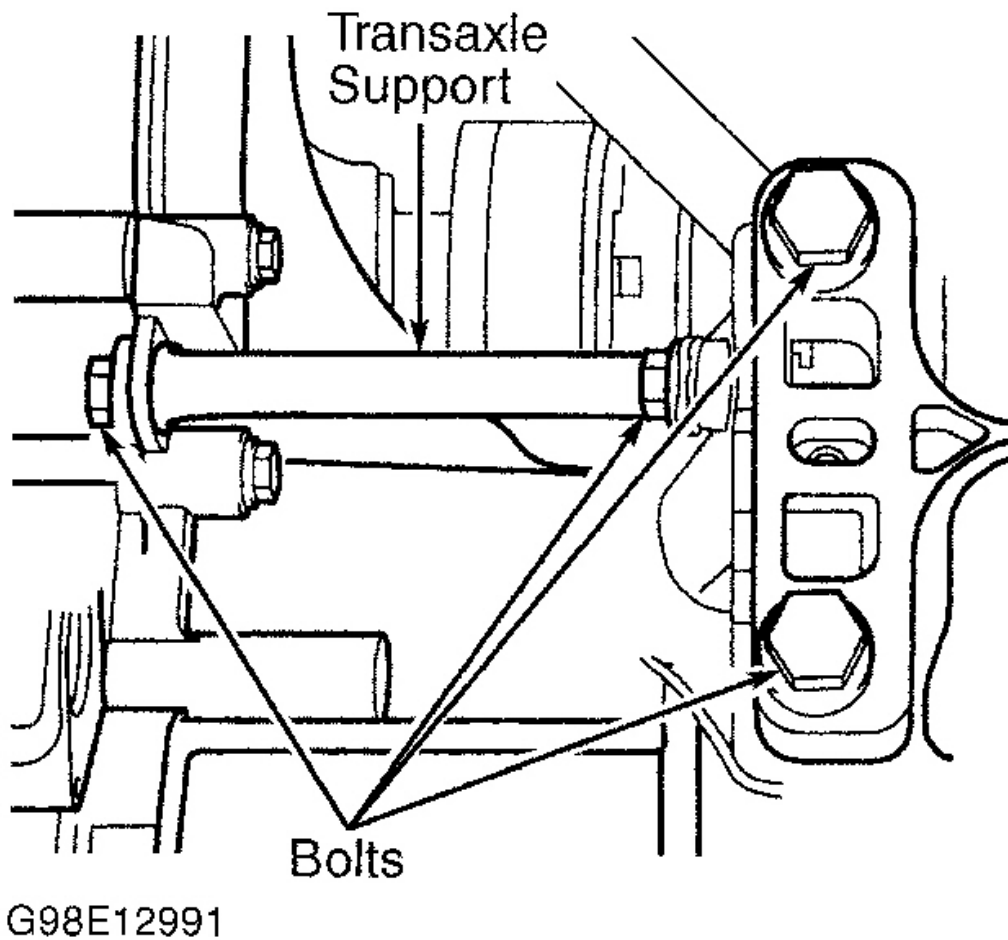
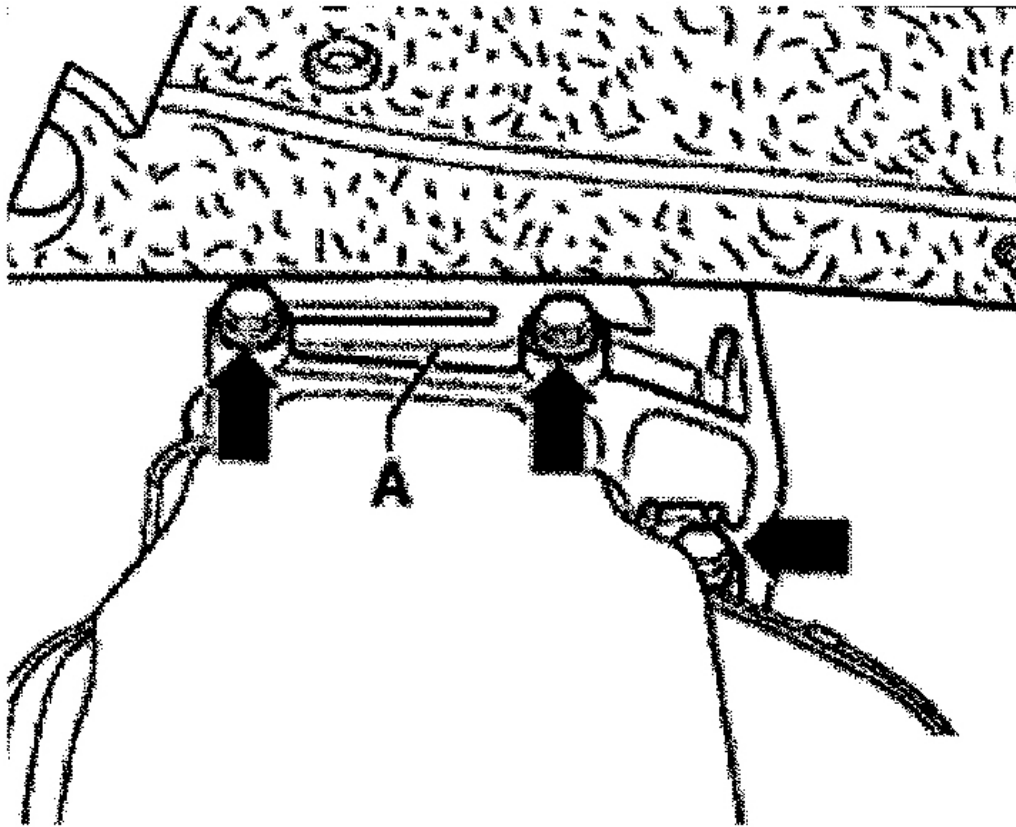


Fig. 63: Identifying Transmission Mounting Bolts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

17. Remove transmission mount (arrows A). See **Fig. 64** . Remove additional fan on right-hand side of vehicle, if equipped.



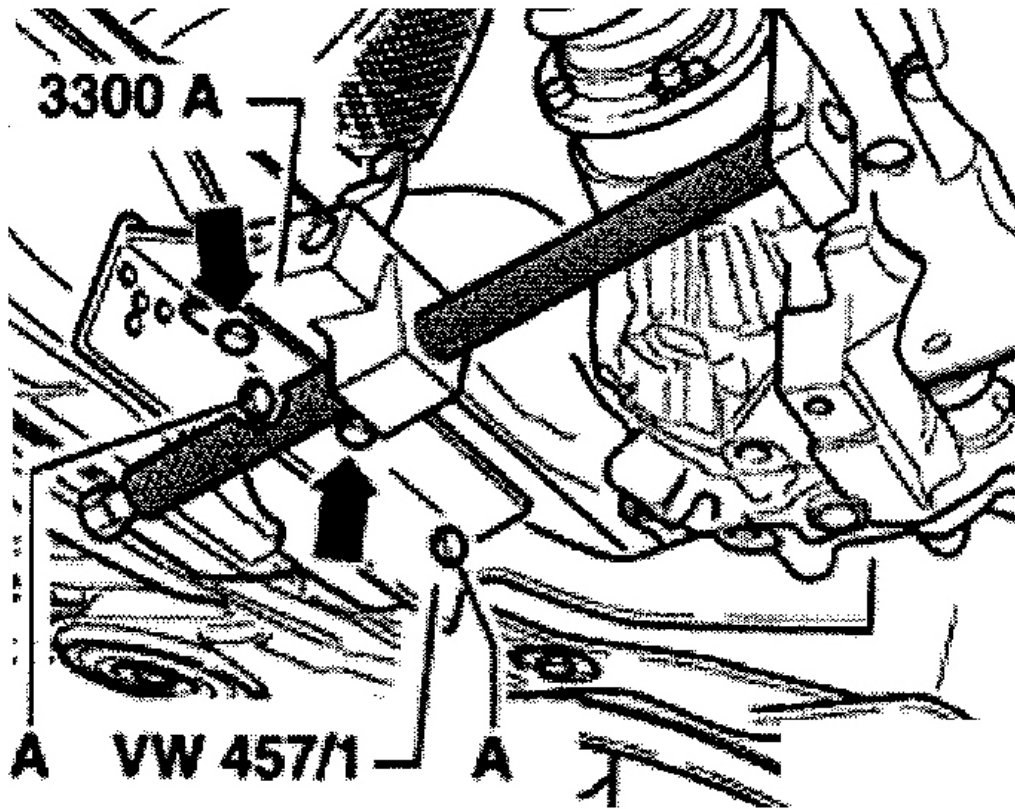
G00204352

Fig. 64: Locating Transmission Mount Bolts
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

18.

NOTE: "A" use bolts M8 x 25. See Fig. 65 .

Bolt support rail (VW 457/1) to both pendulum support securing holes on subframe. See Fig. 65 . When installing support rail, spacers equaling 0.24" (6 mm) must be installed between subframe and support rail (457/1). Mounting rail (T10036) can be used instead of mounting rail (VW 457/1). Install support (3300A) and secure.



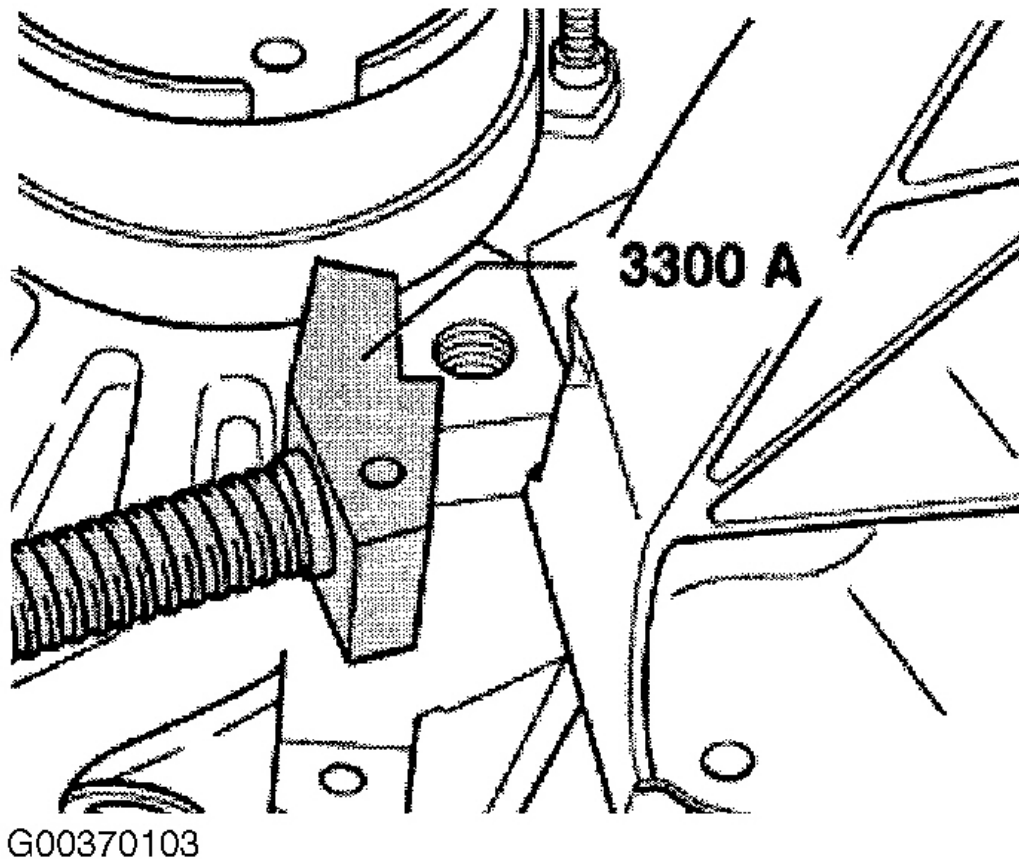
G00370102

Fig. 65: Installing Support Rail (VW 457/1)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

19.

NOTE: On all other models without 1.8L engine, go to next step.

On models equipped with 1.8L, remove lower engine/transmission securing bolts, so support (3300A) can be installed. See **Fig. 66** . Support (3300A) must be installed directly next to transmission on engine.

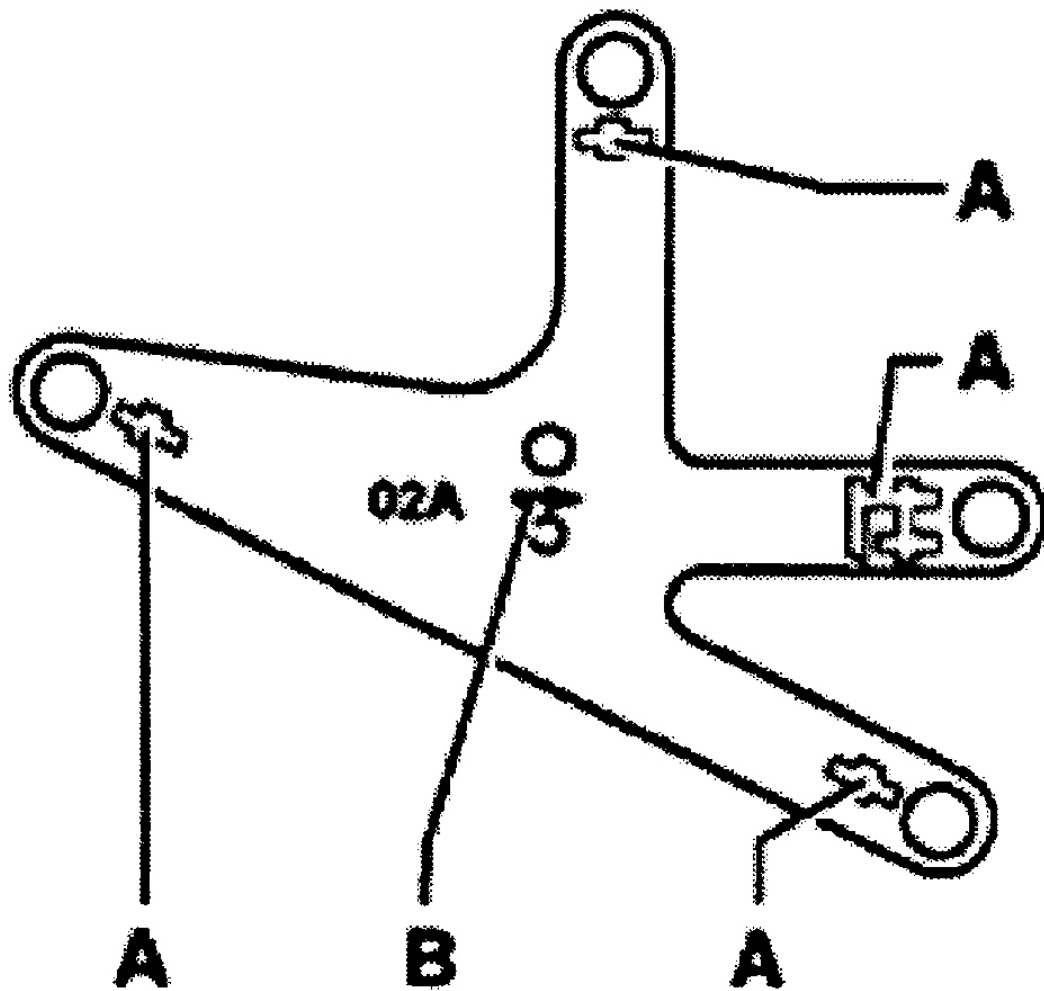


G00370103

Fig. 66: Installing Support (3300A - 1.8L)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

20. On all models, carefully press engine and transmission forward. DO NOT damage power steering line when moving engine and transmission assembly. Assemble transmission jack with transmission support (3282), adjustment plate (3282/8) for "02A" transmission and support elements. See **Fig. 67** . Bolt on support elements (A) as shown. Note arrow (B) indicates front of vehicle. Place adjustment plate (3282/8) on transmission support (3282). Adjustment plate only installs in one direction.

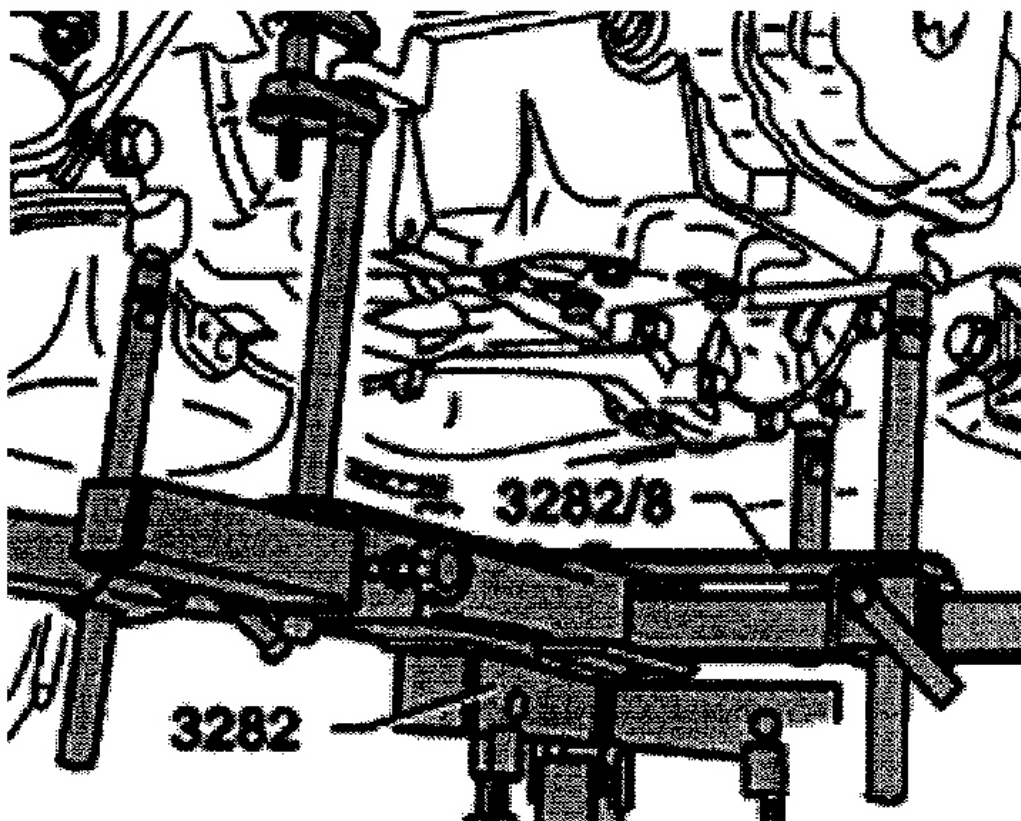


G00370051

Fig. 67: Identifying Support Elements

Courtesy of VOLKSWAGEN UNITED STATES, INC.

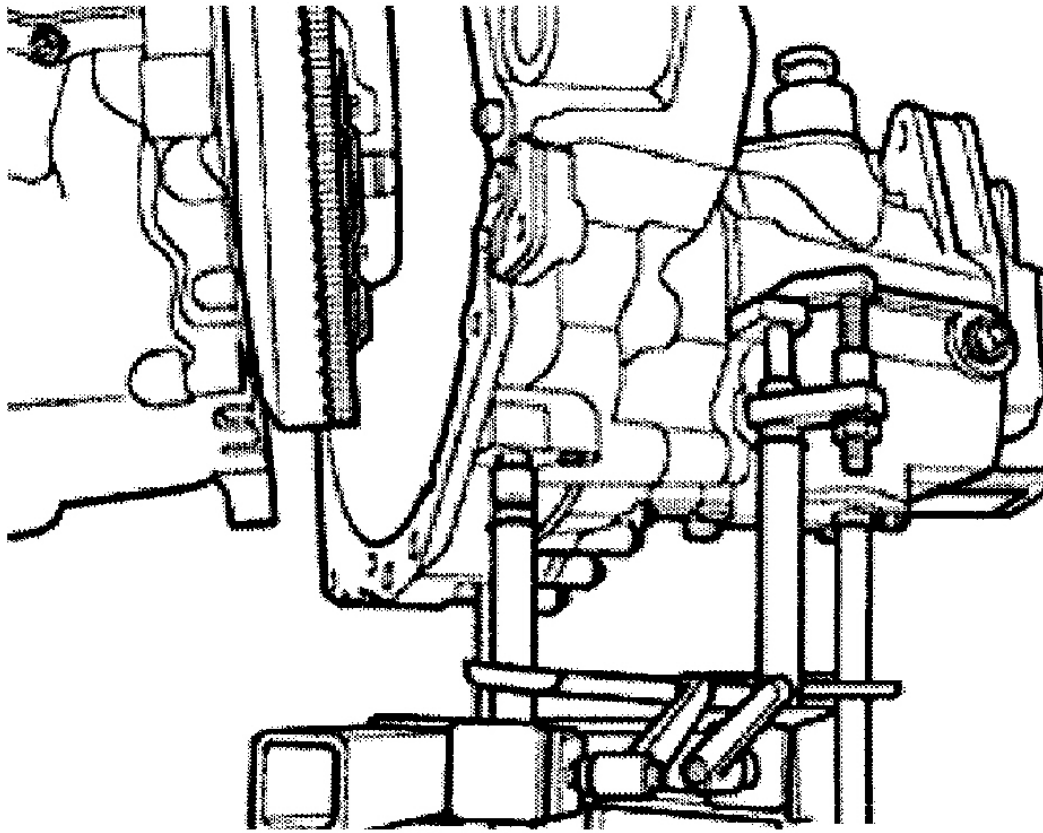
21. Position transmission jack under vehicle. See **Fig. 68** . Align adjustment plate parallel to transmission and lock safety supports on transmission. Remove lower engine/transmission securing bolts.



G00370104

Fig. 68: Installing Transmission Jack
Courtesy of VOLKSWAGEN UNITED STATES, INC.

22. Press transmission off dowels, and carefully swing toward subframe. See **Fig. 69** .

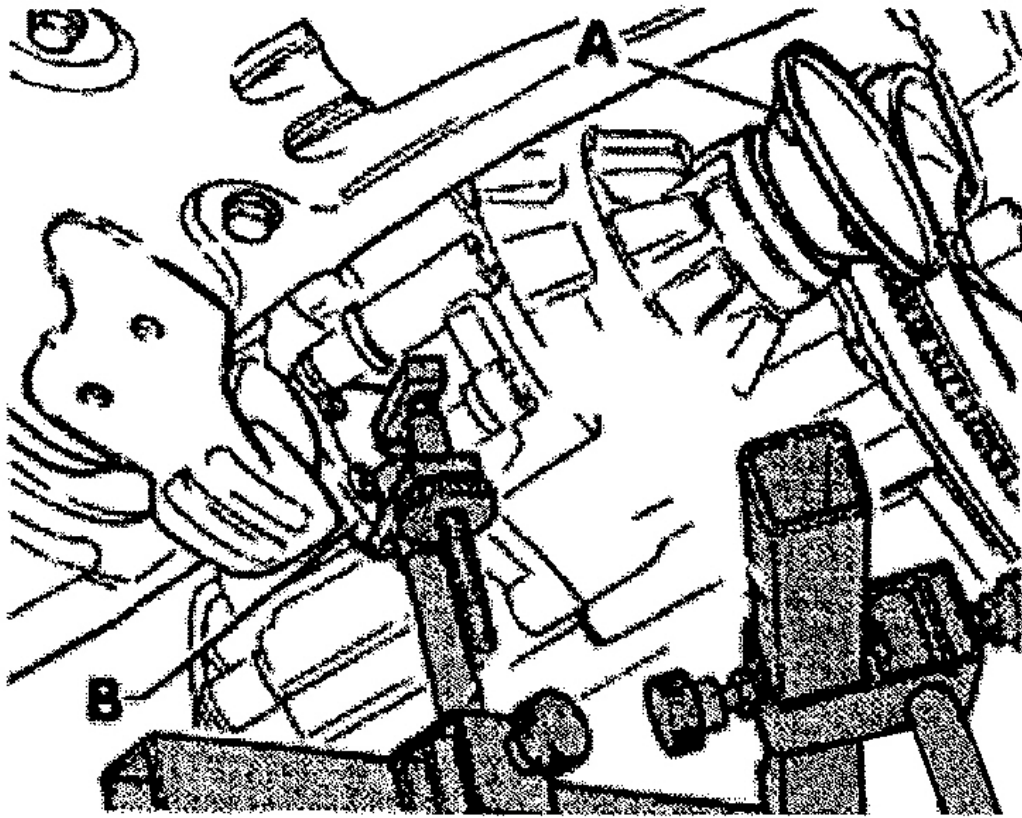


G00370052

Fig. 69: Lowering Transmission

Courtesy of VOLKSWAGEN UNITED STATES, INC.

23. Lower transmission carefully, guiding right-hand flange shaft (A) in area of flywheel as illustrated. See **Fig. 70** . Guide left-hand flange shaft (B) in area of subframe. When lowering, change position of transmission using transmission support (3282) spindles. Lower transmission, being careful not to damage power steering line.



G00204341

Fig. 70: Removing Transmission Past Left & Right Drive Flanges
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Installation

1. Before installing transmission, press clutch release lever toward transmission housing and secure it with an assembly pin, assembly bolt or a M8 x 35 bolt. Remove pin or bolt after transmission has been installed. Hole will then be sealed by 3rd cable support bracket securing bolt. See **Fig. 25**.
2. To install, reverse removal procedure. Apply grease to ball stud and inner surface of release bearing. Clean hub splines of input shaft and apply a light coat of grease. Ensure clutch disc slides on input shaft splines.
3. Check whether dowel sleeves for aligning engine/transmission are fitted in cylinder block, install if necessary. Ensure that intermediate plate is correctly positioned on engine.
4. Bolt support rail VW 457/1 to both pendulum support securing holes on subframe. See **Fig. 65**. Use 2 hex bolts, M8 x 25. Spacers totaling 6 mm must be inserted between subframe and support rail VW 457/1.

5. Vehicles with 1.8L engine: Install support 3300 A and secure (arrows). See **Fig. 66** . The support 3300 A must sit on the threaded boss on the engine.
6. Install pressure plate bolts finger tight. Using clutch centering tool (3190A), align clutch disc and pilot bushing holes. Tighten pressure plate bolts to specification using a crosswise pattern. See **TORQUE SPECIFICATIONS** .
7. If flywheel was removed, use Flywheel Lock (3067) or similar device to hold crankshaft from turning. Tighten flywheel bolts to specification. See **TORQUE SPECIFICATIONS** .
8. Install and tighten lower engine and transmission securing bolts. See **TORQUE SPECIFICATIONS** .
9. Remove support 3300 A (arrows) and support rail VW 457/1. See **Fig. 65** .
10. Install upper engine and transmission securing bolts. See **TORQUE SPECIFICATIONS** .
11. Install transmission console (A) with NEW bolts (arrows). See **Fig. 72** . Align engine and transmission in installation position.
12. Install NEW hex bolts (arrows B) for left hand assembly mounting in transmission mounting. Install transmission support (arrows A) to transmission. See **Fig. 72** .

WARNING: Do not remove support bar (10-222A) until the bolts securing the left-hand transmission mount have been tightened to torque setting.

13. Install pendulum support using NEW bolts for securing. See **Fig. 73** .
14. Reconnect exhaust system. Install retainer for power steering line on starter and on transmission.
15. If removed, install small cover plate (A) behind right-hand drive flange (arrows). See **Fig. 61** . If removed, install large cover plate for clutch. Fit drive axle shafts to transmission.
16. If removed, install protective cap for right-hand inner constant velocity joint to engine. Install starter. Install slave cylinder.
- 17.

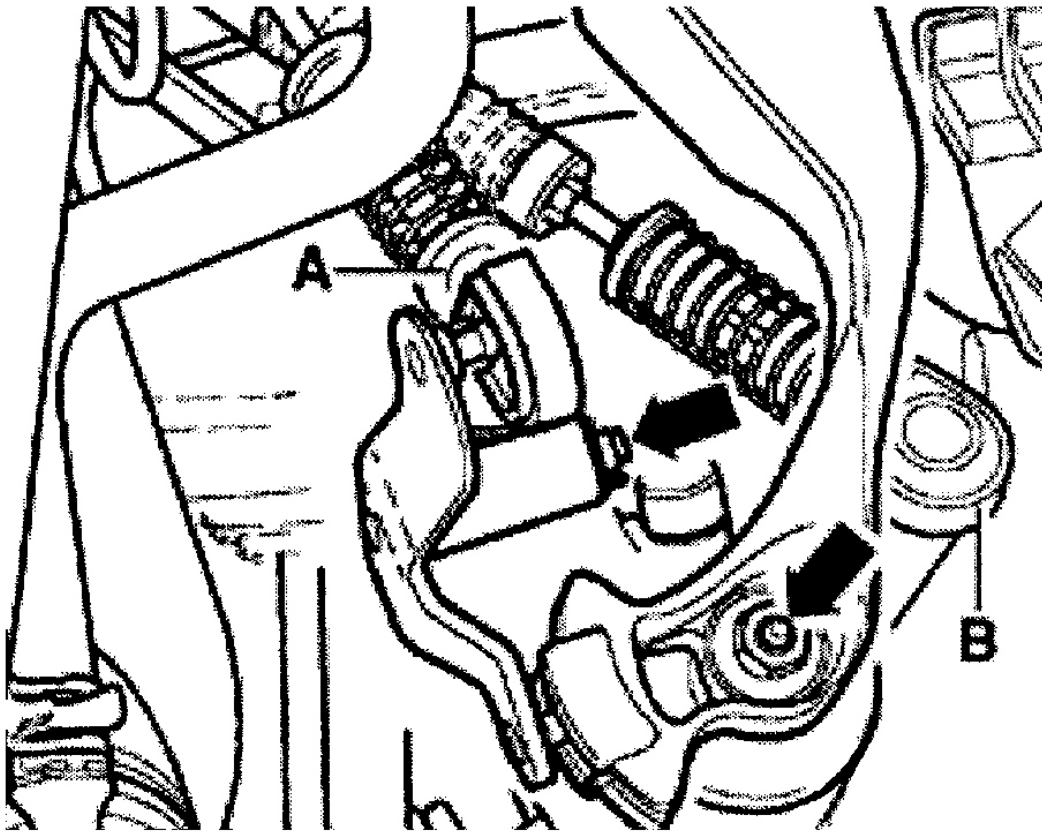
NOTE: For vehicles built FROM June 1999, go to step 19 .

On vehicles built up to May, 1999, install cable support bracket on transmission (arrows). If necessary push hose onto cable support bracket. See **Fig. 47** .

18. Install gear selector cable (B) and balance weight (A) on gear selector lever (vehicles built before May, 1999). Lift tab in direction of arrow and fit gate selector cable on follower/relay lever (C). See **Fig. 46** .

NOTE: Continue transmission installation at step 20 .

19. On vehicles built from June 1999, install cable support bracket to transmission (arrows), press hose (A) n to cable support bracket. See **Fig. 51** . Fit gear selector cable (B) with transmission selector lever (arrow). See **Fig. 71** . Fit gate selector cable (A) with relay lever and secure (arrow).



G00370057

Fig. 71: Removing Gate & Gear Selector Cables (Vehicles Built From June 1999)
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

20. On all models, attach reverse light connector (arrow 2). See **Fig. 56** . Attach all other electrical connections and ground wires to transmission and to engine/transmission securing bolts. Attach connector to speedometer sensor (arrow 1).
21. Assemble air intake duct. Install battery and battery carrier. Reconnect ground strap to battery.
22. Install insulation tray below engine/transmission, if fitted. Install engine cover. Check transmission oil. Adjust gear selector mechanism. See **SELECTOR MECHANISM** under ADJUSTMENTS.

OVERHAUL

CLUTCH ASSEMBLY

Information not available from manufacture.

CLUTCH MASTER CYLINDER

Information not available from manufacturer.

CLUTCH SLAVE CYLINDER

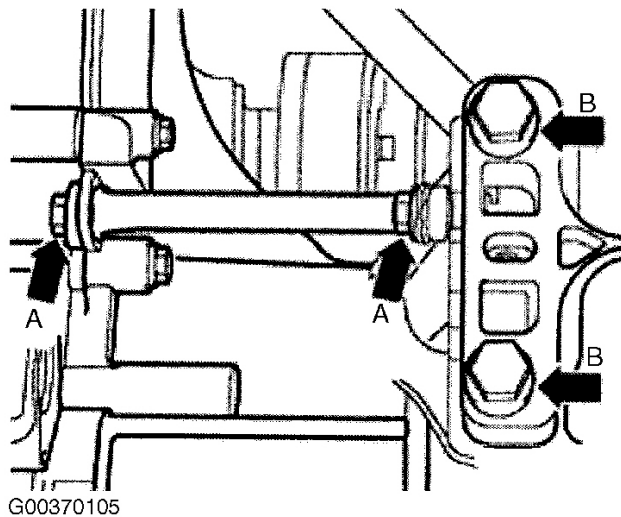
Information not available from manufacture.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Axle Shaft-To-Transmission Flange Bolt	
M8	30 (40)
M10	59 (80)
Clutch Pedal Mounting Plate Nut	(1) 18 (25)
Clutch Master Cylinder Nut	18 (25)
Clutch Slave Cylinder Bolt	15 (20)
Cross Support-To-Body Bolt	18 (25)
Dual Mass/Flywheel-To-Crankshaft Bolt (1)	
Step 1	44 (60)
Step 2	Additional 90° Turn
Exhaust System Nut	22 (30)
Gearshift Selector Assembly	
Balance Weight-To-Selector Lever	18 (25)
Cover Plate Bolt	18 (25)
Gear Selector Cable Bolt	18 (25)
Gear Selector Lever Nut	18 (25)
Relay Lever Nut	11 (15)
Support Bracket Bolt	18 (25)
Selector Cable-To-Selector Lever	18 (25)
Selector Lever-To-Transmission	18 (25)
Pendulum Support Bolt	(1) , (2)
Pressure Plate Bolt (3)	
2-Piece Flywheel	10 (13)
Single Piece Flywheel	15 (20)
Starter Bolt	48 (65)
Transmission Mount-To-Transmission Bolt (1)	
Step 1	37 (50)
Step 2	Additional 90° Turn
Transmission-To-Body Bolt	(4)

Transmission-To-Engine Bolt	(5)
Wheel Lug Bolt	89 (120)
(1) Always replace with NEW fastener. Always replace self-locking nuts. (2) See Fig. 73 . (3) Loosen or tighten bolts gradually, in a crosswise pattern. (4) See Fig. 72 . (5) See Fig. 74 .	

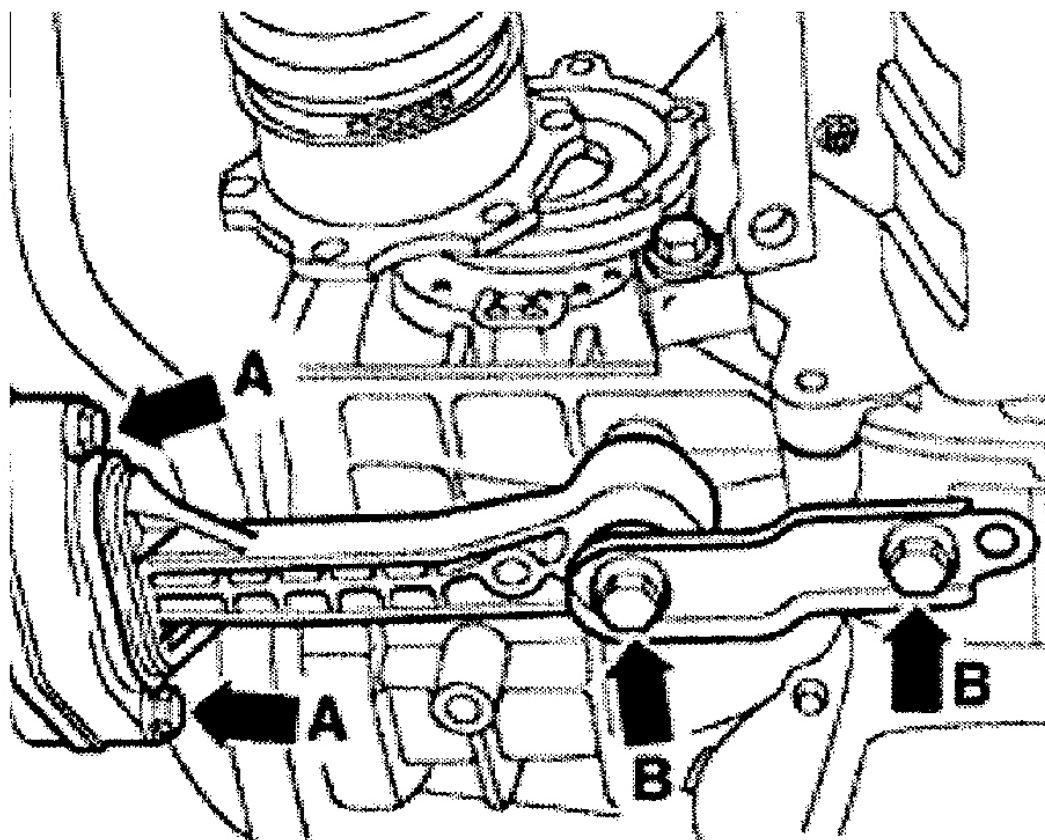


- Replace bolts -B-.

Bolts -A- 25 Nm

Bolts -B- 60 Nm + 90 °

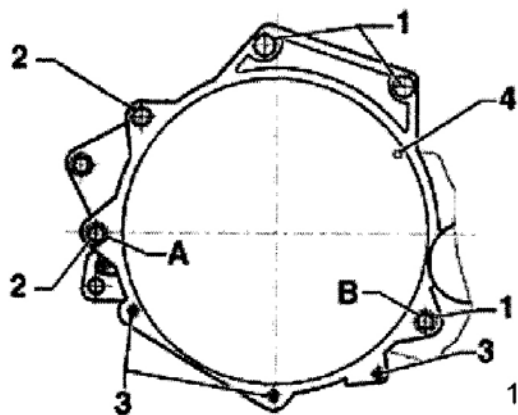
Fig. 72: Identifying Transmission-To-Body Bolt Torque Specifications
 Courtesy of VOLKSWAGEN UNITED STATES, INC.



Bolts -A- 20 Nm + 90°
Bolts -B- 40 Nm + 90°

G00370056

Fig. 73: Identifying Pendulum Support Bolt Torque Specifications
Courtesy of VOLKSWAGEN UNITED STATES, INC.



Item	Bolt	Qty.	Nm
1	M 12 x 55	3	80
2 1)	M 12 x 150	2	80
3	M 10 x 50	3	40
4 2)	M 7 x 12	1	10

1) In addition, starter to transmission

2) Small cover plate for flywheel

Items A + B - Dowel sleeves

G00370106

Fig. 74: Identifying Engine/Transmission Bolt Torque Specifications
Courtesy of VOLKSWAGEN UNITED STATES, INC.